MARCH 23, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

'59: Bottom of Saucer for Industrial Construction

We won't return to the 1957 pace of $3.6 billion worth of new construction put in place until 1961, but this year should see the start of an upturn . . . . . Page 67

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How World's Steel Wages Compare; U. S. Two to Eight Times Higher

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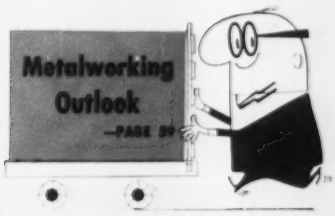
Weather May Delay Lake Ore Ships



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THIS MUCH MORE in '59

Expansion was not the order of the day during the past year, but it was in this period that the growing sales of "Double Diamonds" required the addition of 60% more manufacturing space. Hence, we now enter the more promising future with better and more facilities to serve as your "gear department" or to fill your gear orders with "Double Diamond" Gears that are built *to produce low installed cost . . . to serve economically and dependably on the job for which you buy them . . . and to do credit to your product and your reputation.*

May we send you this catalog of the gear types in which we specialize: helical gears, flywheel starter gears, straight bevel gears, straight spur gears, angular bevel gears, hypoid bevel gears, gear assemblies, zerol* bevel gears, spiral bevel gears, and spline shafts?

*Reg. U. S. Pat. Off.

EATON

AUTOMOTIVE GEAR DIVISION
MANUFACTURING COMPANY
RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS

IF ALL THE DELIVERY TRUCKS

OF ALL THE STEEL SERVICE CENTERS

WERE PLACED END TO END,

TRAFFIC WOULD BE TIED UP FOR MONTHS!

BUT, FORTUNATELY, THEY'RE NOT END TO END ...

THEY'RE BUSY THROUGHOUT THE COUNTRY

DELIVERING STEEL FAST.

SPEEDY DELIVERY IS JUST ONE OF THE MANY SERVICES

OF YOUR LOCAL STEEL SERVICE CENTER!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Bethlehem Pacific Coast Steel Corporation,
San Francisco

BETHLEHEM STEEL

Cost cutting ideas in **TITANIUM**

24" dia. impeller fabricated from Mallory-Sharon commercially pure titanium. Diagram shows application in gas scrubbing system.

TITANIUM IMPELLER PROVED "BEST BY TEST"

...outlasts other metals more than 40 to 1

CORROSION TEST DATA

Results after 16 day exposure

MATERIAL	CORROSION RATE INCHES YEAR	COMMENTS
Pure Titanium	0.0006	No visual effect
Pure Zirconium	0.027	Slight pitting
Nickel-Base Alloy "A"	0.052	Slight uniform corrosion
Nickel-Base Alloy "B"	0.206	Sample etched
Nickel-Base Alloy "C"	0.217	Sample etched
Nickel-Base Alloy "D"	5g.	Sample consumed
300 Series Stainless "A"	0.442	Sample deeply etched
300 Series Stainless "B"	0.510	Sample deeply etched
Nickel-Copper Alloy	50g.	Sample consumed
Nickel	55g.	Sample consumed
Metallic Silver	20%	Gain in Weight

Approximate conditions of test: *Temperature–40° to 90°F., Humidity–atmosphere more than saturated. Primary corrosive agents–Hypochlorous acid, Hydrochloric acid, Sodium Hypochlorite, Caustic Soda, Free Chlorine.*

A leading chemical company faced a serious problem in a multi-metal chloride "gas scrubbing" system. The system's high-velocity blower, handling corrosive wet gases at 40° to 90°F., operated at 3500 rpm. Peripheral speeds were too high to use a plastic coated steel impeller. When one was tried, it lasted just two days.

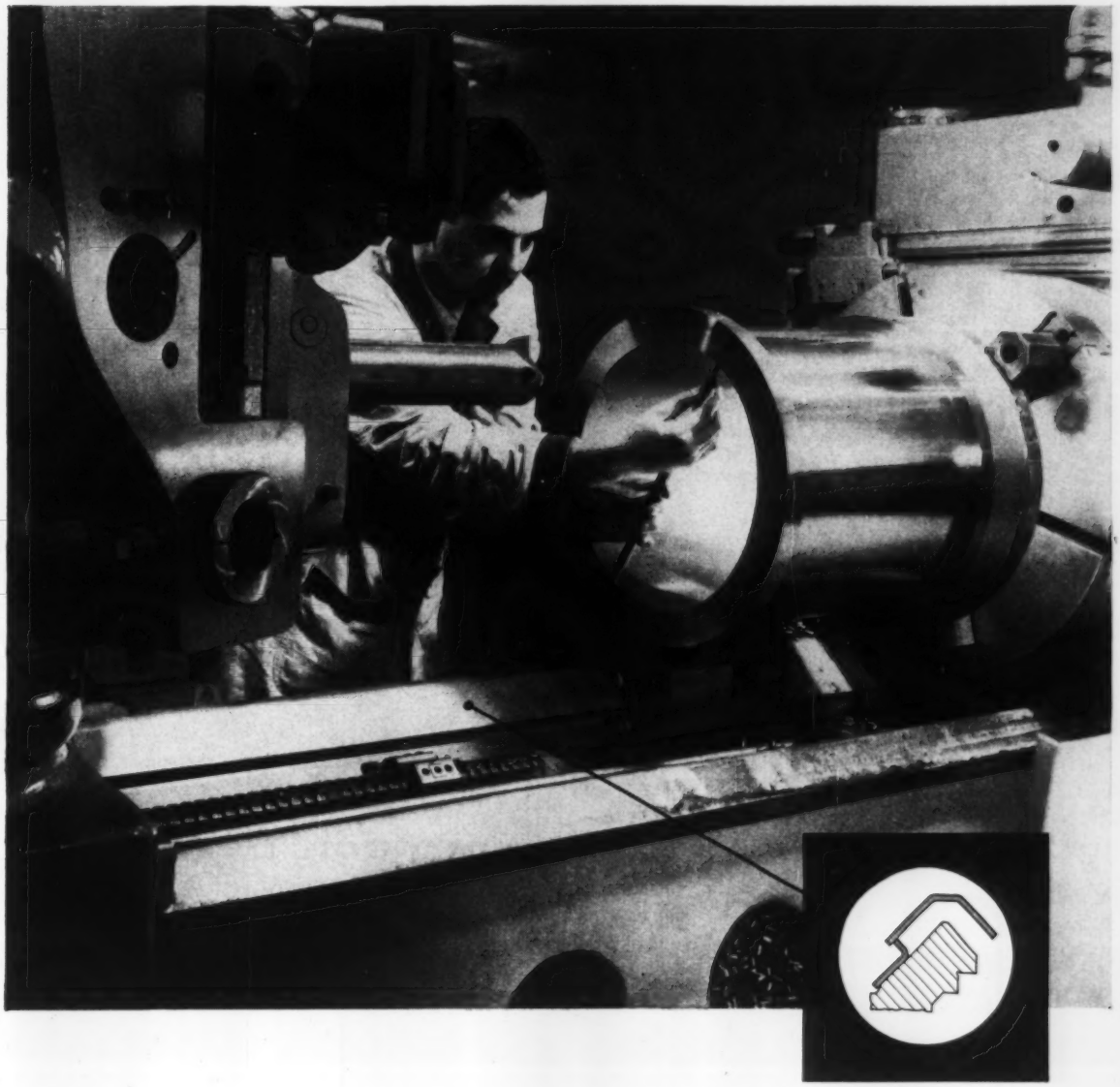
Titanium was then considered with other metals, and evaluation tests run that proved titanium was by far the best. (See test results at left.) An impeller fabricated from Mallory-Sharon commercially pure titanium was installed. To date, it has given *10 months' continuous service* and is still in use. And *the original cost was no more* than for a nickel-base alloy impeller.

We'll gladly help you in applying titanium for highly corrosive service. For further information, write for "Cost Cutting Ideas in Titanium for Chemical Pumps, Valves and Accessories". Address: Commercial Market Development, Dept. B, Mallory-Sharon Metals Corp., Niles, Ohio.

MALLORY MS SHARON

MALLORY-SHARON METALS CORPORATION • NILES, OHIO

Integrated producer of Titanium • Zirconium • Special Metals



VEE-WAY ACCURACY and EASE OF OPERATION

preserved by Warner & Swasey's telescoping way covers

Regardless of carriage or saddle positions on the bed, Warner & Swasey's patented Telescoping Way Covers provide complete bedway protection. Tools, gritty materials, cutting fluids, even heavy work-pieces can fall on the Way Covers but the accuracy and free-sliding smoothness of Warner & Swasey's exclusive self-guiding Vee-Ways are fully protected throughout years of hard use... and with a minimum of maintenance. As a result, dependable, close-tolerance performance is easy to maintain without fighting or pampering the machine.

When operators like the equipment on which they work—production increases. So, why not let our Field Representative show you all the operator advantages designed into Warner & Swasey Turret Lathes? It can save you money.

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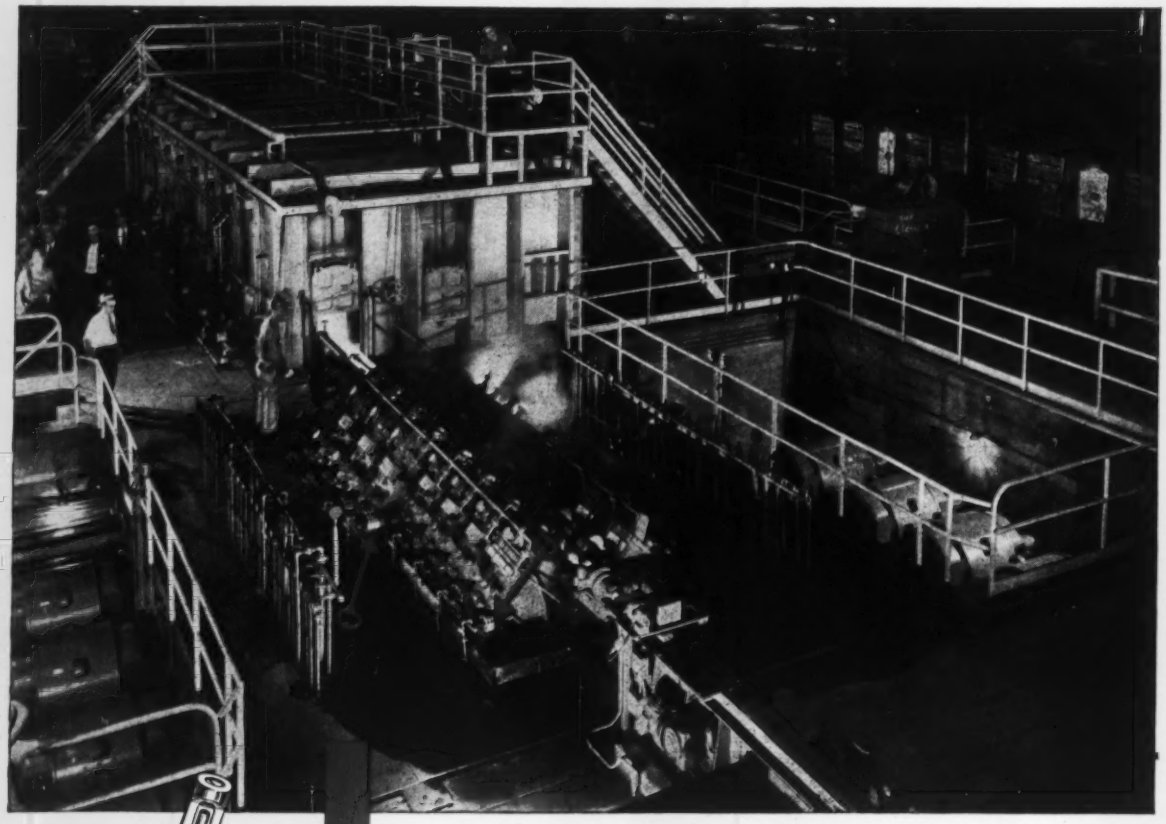
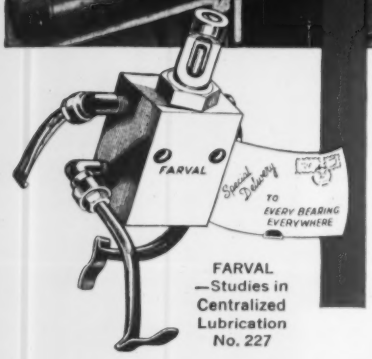
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY





FARVAL
—Studies in
Centralized
Lubrication
No. 227

Farval protects bearings as tubing is reduced from 7 to 2 inches

ON this 16-stand Aetna-Standard tube stretch reducing mill, bearings take tremendous pressures as cherry red tubing is reduced from 7 to 2 inches in diameter. And lubricating those essential components is a Farval centralized system delivering measured amount of lubricant at set intervals to every bearing. These bearings are lubricated automatically and safely while the mill is actually in operation.

For bearing protection on your machinery, check with Farval for lubrication. For specifications and drawings, ask for Bulletin 26-S. Write The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

KEYS TO ADEQUATE LUBRICATION
—wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

This Week in STEEL The Metalworking Weekly

March 23, 1959
Vol. 144 No. 12

EDITORIAL 65

Management must do more to clear up mistaken notions about the role of corporate profits.

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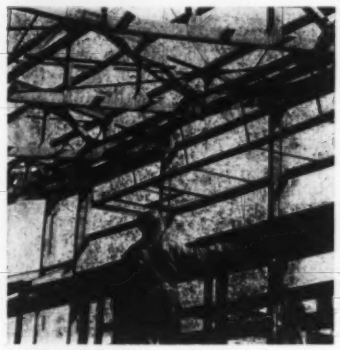

Look for a marked upturn in industrial construction in the last half of 1959 or early in 1960 at the latest. The 1960-61 period is expected to see a return to 1957 levels.

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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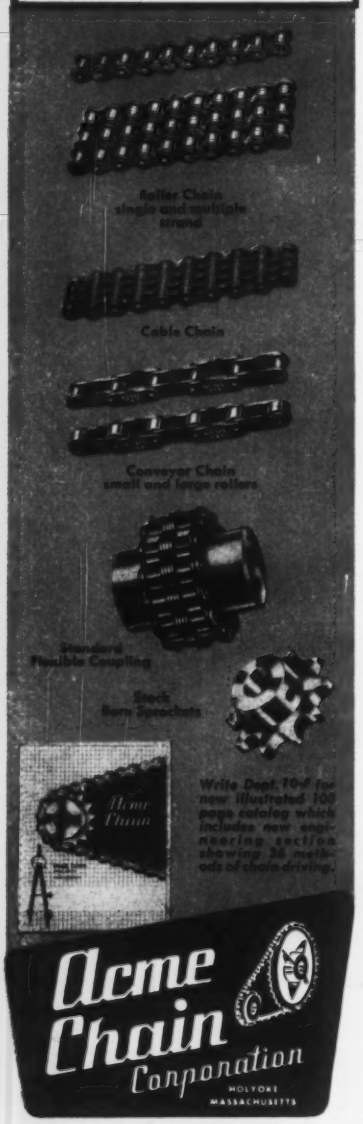
No Costly Delay when YOU *specify* ACME CHAIN

PROMPT DELIVERY in all sizes on ACME CHAINS — SPROCKETS COUPLINGS IN ANY QUANTITY FROM YOUR DISTRIBUTOR


Roller Chain
single and multiple strand
Cable Chain
Conveyor Chain
small and large rollers
Standard Flexible Coupling
Stock Bore Sprockets
Write Dept. 10-F for new illustrated 108 page catalog which includes new engineering section showing 36 methods of chain driving.
Acme Chain
Corporation
HOLYOKE MASSACHUSETTS

behind the scenes

Cost Crisis Awards

On Page 108 of this week's issue, STEEL reveals names of the winners of its 1958 Cost Crisis Awards Competition. As you remember, your favorite metalworking weekly last year feverishly explored new ways to lower unit production costs through efficient use of new or improved capital equipment. STEEL's editors recognized that the cost crisis—created by leveling or shrinking sales volume, greater resistance to price increases, and continuing upward cost pressures—constituted metalworking's most challenging crisis since World War II.

Instead of sitting in the well advertised ivory tower and theorizing, STEEL's editors invited comments from the firing line. They asked full time employees of metal producing or metalworking plants, particularly production, engineering, and purchasing supervisors, to describe how they had cut production costs through the use of more efficient equipment.

Four thousand seven hundred thirty-one (somehow, that looks more impressive than 4731) readers requested entry blanks. From the replies, STEEL selected 130 entries as potential editorial material. Forty-eight features were published, ten of which won top awards. Top awards, of course, were ten handsome, square, glass-walled Atmos clocks, suitably marked and engraved.

At this point we could list the names of the winners, but we have no intention of spoiling the suspense. After whetting your interest, we have no additional reportorial responsibilities. The completed report awaits your attention, beginning (as previously mentioned) on Page 108.

Momentous Ms

R. C. Griggs, who asked us not to bother acknowledging his letter, was kind enough to send some curious speculation on the letter "M" in manufacturing. The big three, he said, are Men, Materials, and Machines. Men are the Most important, and Must be fired with high Morale through the best use of their Mentality and Muscle. Material is the second Most important, and Must be treated to the best Methods. Machines are the third Most important, and Must be given the Maximum amount of Maintenance. The successful Management of the three Ms is derived from a Meeting of the Minds at the top, with the results Made available to others through word of Mouth and other Messages. In the end, if Marketing and Margin are sound and realistic, then Money will accrue from the sale of Merchandise created by Manufacturing.

That's a Mighty Mellow Manipulation, Mister.

Avuncular Interest

Henry Ford is reputed to have remarked that he didn't care what people said about him, so long as they spelled his name correctly. The remark is probably true because most individuals shudder when they see their names mutilated in print. We received a pleasant communication from a gentleman in Springfield, Ohio, but because we can't make out his name for sure, we're not going to risk hurting him by a chance spelling. He is a watchman at the Springfield Mfg. Co., and confesses that he has read STEEL every week for 17 years.

The teaser about the bus lines from Gnadenhutten to Ashtabula to Wapakoneta (STEEL, Feb. 16, p. 6) interested him because he has several nephews in Gnadenhutten, and he wants to know the answer before he springs the problem on them. Thank you for your interest, sir—and the answer is 12. Must be right purty down in Gnadenhutten at this time of the year, with the cottonwood and willow budding along the banks of the Tuscarawas, and the faintest haze of green creeping over the hills.

Tra La Department

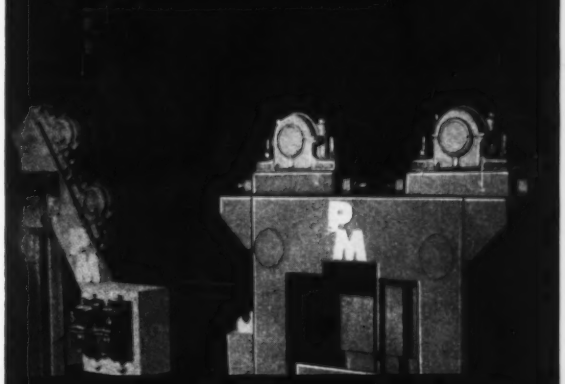
Because today is the first day of spring (or the second, if your watch is slow), let us give it the observation it deserves. If you are 19 or 90, it doesn't make any difference; mentally, that is. Hit the beat Jackson:

I'm looking for a rhyme with a deep sea swing,
I'm looking for rhyme with a lilt;
A rhyme that sort of wiggles, and matches up with spring,
And swings like a braw Scot's kilt.
With a change of pace,
With a banjo strum,
And the throbbing beat
Of the big bass drum.
Away with all the songsters who sing soft songs,
Away with all the sticky stuff on spring;
Let's junk the lutes and lyres, and beat on big brass gongs,
And slap on the bull fiddle strings.
You could love like mad
Should your arteries thrum
In spring, to the beat
Of a big bass drum!

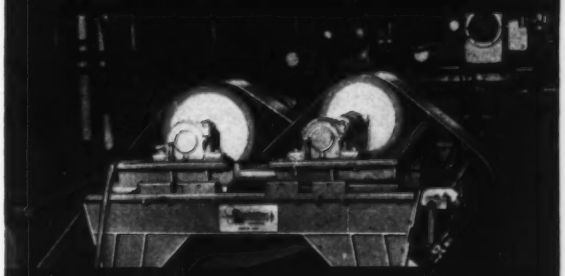
Shrdlu

(Metalworking Outlook—Page 59)

Finish end of new PM 2-strand pickle line that improves output, quality for stainless steel producer. (Note evenness of coils on PM coilers.)



Separate, independent rolls for each strand have shafts mounted in anti-friction bearings outside pickle tanks away from corrosive fumes. This permits rolls to turn freely, so as to prevent scratching of stainless steel.



Greater wrap of stainless steel around idler support rolls, and special surface of roll covers, also insure free turning, non-scratching rolls to handle wet, slippery steel.

PM's "PRODUCTIONEERED EQUIPMENT"

Key to • more output... • better quality... • improved operation from this new pickle line

As an example of what PM's "productioneered equipment" can do for you, take one *feature of a new PM pickle line recently installed for a major steel producer:*

Previously, support rolls on continuous pickling lines processing stainless steel tended to mar the surface of the metal. Marks were produced when the idler rolls failed to turn as fast as the strip passing over them.

Because PM designers *understood* this problem, they were able to design the new pickle line with special bearings, provision for a greater degree of wrap of the steel around the rolls, special type of surface on the rubber covering, and other design details which insure the rolls turning at strip speed, so as to eliminate scratching of the stainless steel.

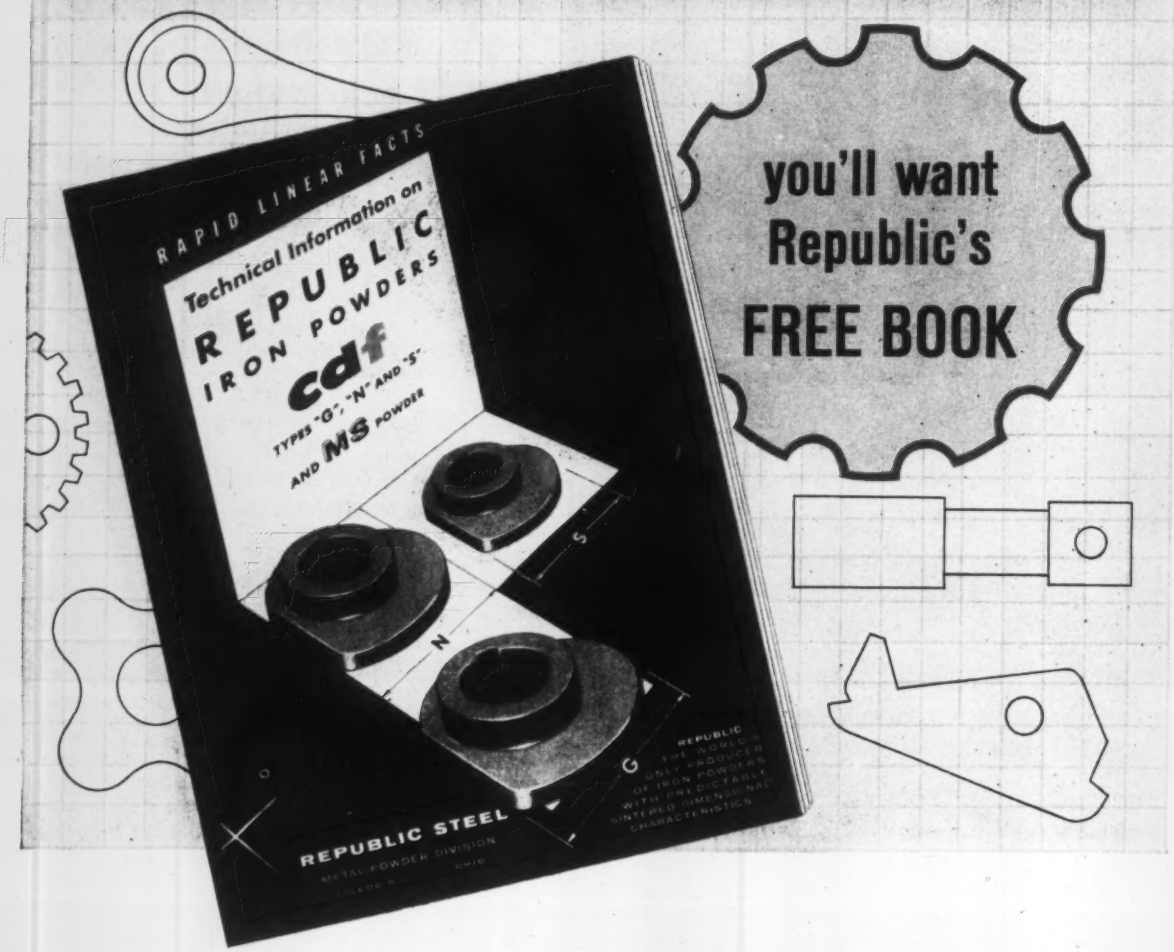
This and additional design refinements such as automatic strip tracking devices make this line capable of more usable output, with greater uniformity in product quality, and less trouble for operators.

Productioneering can solve tough production equipment problems for *you*, too. *Productioneering* is the PM way of working so engineers who supervise designing have first-hand knowledge of problems encountered by machinery owners. In working with PM, you work with responsible experienced engineers who apply their skill to solve your problems. PM's equipment recommendations suit your specific needs—that's why it pays to *call in a PM man* as soon as you start planning installation of any of the metal processing equipment listed below.

Production Machinery Corporation
Mentor, Ohio

Continuous strip pickling lines
Stainless steel processing equipment
Slitting lines
Shearing and cut-to-length lines
Vacuum and magnetic sheet feeders and pilers
Uncoilers, shears, pinch rolls, reels, and other special equipment

If you design or fabricate iron powder parts...



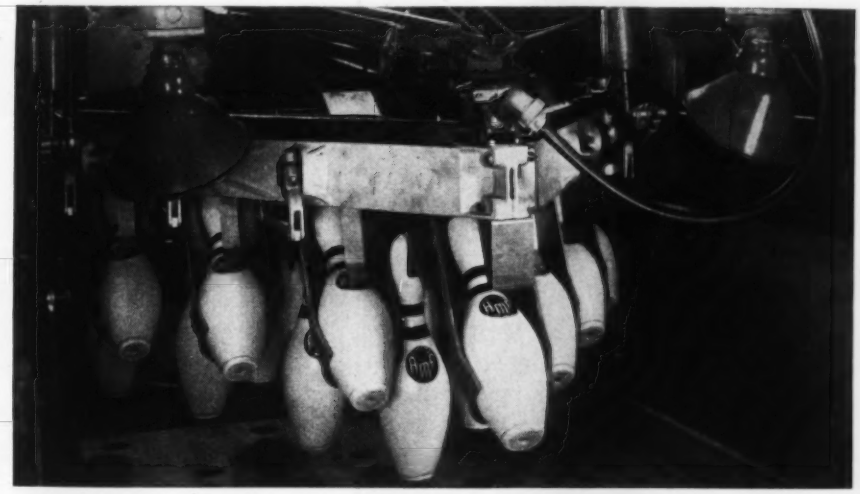
This new 48-page book has been prepared especially for tool engineers, part designers, metallurgists, and fabricators. It contains complete technical data on Republic's improved Controlled Dimensional Factor Powders and new MS Powder.

Data are presented by an entirely new method. Most of the necessary information regarding a particular powder's behavior can be read from the curves on a single set of ordinates.

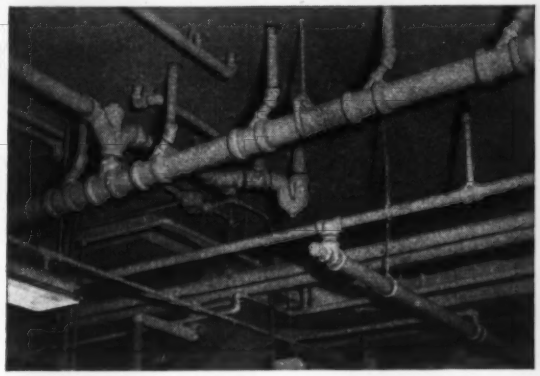
The first section of the book lists complete specifications for Republic's CDF Powders, Type "G" for growth, Type "N" for normal, Type "S" for shrinkage. Each of these powders has been improved with regard to compressibility, dimensional characteristics, and increased tensile strengths.

Section two provides complete information on Republic's new MS Powder, developed principally for use with graphite rather than copper. MS possesses features which make it economically attractive for use in a wide variety of mechanical parts, and in electrical and magnetic applications.

Mail the coupon for your free copy of Republic's new Iron Powder Book, ADV. 1014.



AMF CUTS COSTS, builds a better pinspotter with Republic ELECTRUNITE® Mechanical Tubing. On the initial order, ELECTRUNITE saved American Machine & Foundry Company, Brooklyn, New York, $34,000 in manufacturing their famous AMF Automatic Pinspotter. AMF was able to eliminate boring and grinding operations because ELECTRUNITE met O.D. tolerance requirements. This feature resulted in a savings of $15,000 in fabricating operations. Another $19,000 was saved on the cost of ELECTRUNITE as compared with tubing previously used. In uniformity, quality, original costs, Republic ELECTRUNITE Mechanical Tubing can save you time and money, too. Call Republic, or mail coupon for facts.



GOOD PERFORMANCE PLUS ECONOMY provided by Republic Steel Pipe make it ideal for a wide range of industrial piping applications. Illustration shows steel pipe used for steam, air, waste, and sprinkler system lines. Beyond low cost and long life, Republic Steel Pipe permits fast, economical installation. Because each length of Republic Pipe is uniform in strength, ductility, and wall thickness, operations including cutting, threading, bending, and welding are simplified. For complete information on types, sizes, and specifications, contact your nearest Republic Pipe Distributor. Or send coupon.

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Name_____ Title_____

Company_____

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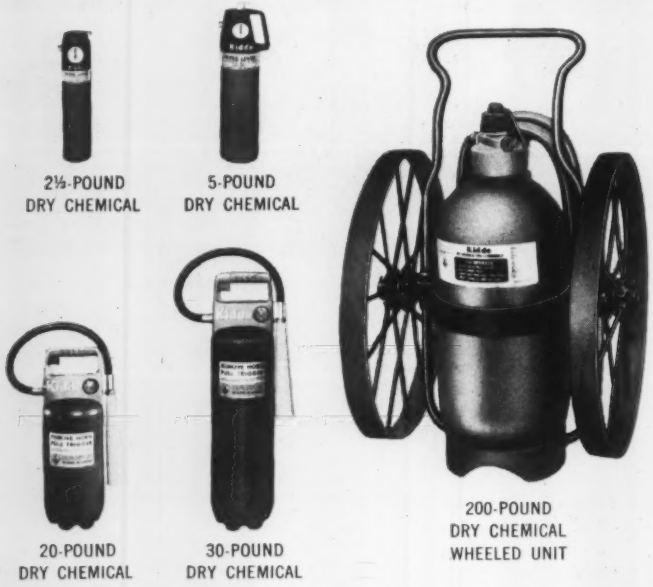
Now! FULL-POWER Fire Fighting with this complete dry chemical line!



Kidde top-rated portables and wheeled units kill more fire... faster!

From the powerful new 2½-pound portable, on up to the giant 200-pound wheeled unit, Kidde dry chemical extinguishers pack the *extra* punch needed for stubborn blazes, for *full-power* fire fighting. Available in pressurized 2½, 5, 10, 20 and 30-pound capacities, Kidde dry chemical portables feature simple, one-two operation, are easiest of all portables to operate, even while wearing gloves. Kidde portables have no valves to turn, no pins to pull, need no bumping or inverting. Just aim, pull trigger, and fire's out! All are quickly and easily pressurized, have dust- and moisture-proof gauges which show at a glance when unit is charged.

The 200-pound Kidde pressurized wheeled unit discharges a 40-foot dry chemical stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. It's faster and easier to operate . . . just remove pin, swing toggle lever, and flip on-off lever. Easy to maneuver because of its low center of gravity and larger wheels. Truly a one-man fire engine!

All Kidde extinguishers are granted top rating by Underwriters' Laboratories, are the finest extinguishers on the market today. Get more information about this *complete* line of *full-power* fire fighting equipment. Write to Kidde today!

Kidde

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360 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal — Toronto — Vancouver

LETTERS TO THE EDITORS

Shortage Interests Engineer

I was much interested in your article, "Engineer Shortage To Recur; Counter It with Creativity" (Feb. 16, p. 108). May I have a copy of this article?

C. L. Devendorf
Chief Engineer
Aircraft & Missile Engineering
Rheem Mfg. Co.
Downey, Calif.

Thoughts on Depreciation

After reading "What Depreciation Reform Does American Industry Want?" (Mar. 2, p. 69), I would like to submit my thoughts on depreciation allowances.

The facts are best presented in list form:

1. The general opinion is that depreciation allowances under the present Federal Tax Code are resulting in confiscation of corporate assets.

2. Large corporations have been reluctant in recent times to issue new equity securities.

3. Various financial analysts and a Federal Reserve Bank claim that cash-earnings better represent corporate profitability due to accelerated depreciation and amortization.

4. Since depreciation allowances result in added cash availability, and this cash used for capital investment, future national productivity should increase.

Considering these facts carefully, the following may be concluded:

1. Realistically speaking, as a result of inflation, rapidly increasing technology, and tax law, the depreciation allowances and debt securities are being substituted for equity investments as a source of funds for capital expansion.

2. Since investment is so important in determining our economic level, if depreciation allowances are thrown open, the cyclical fluctuations in investment may be more difficult to control and more disastrous.

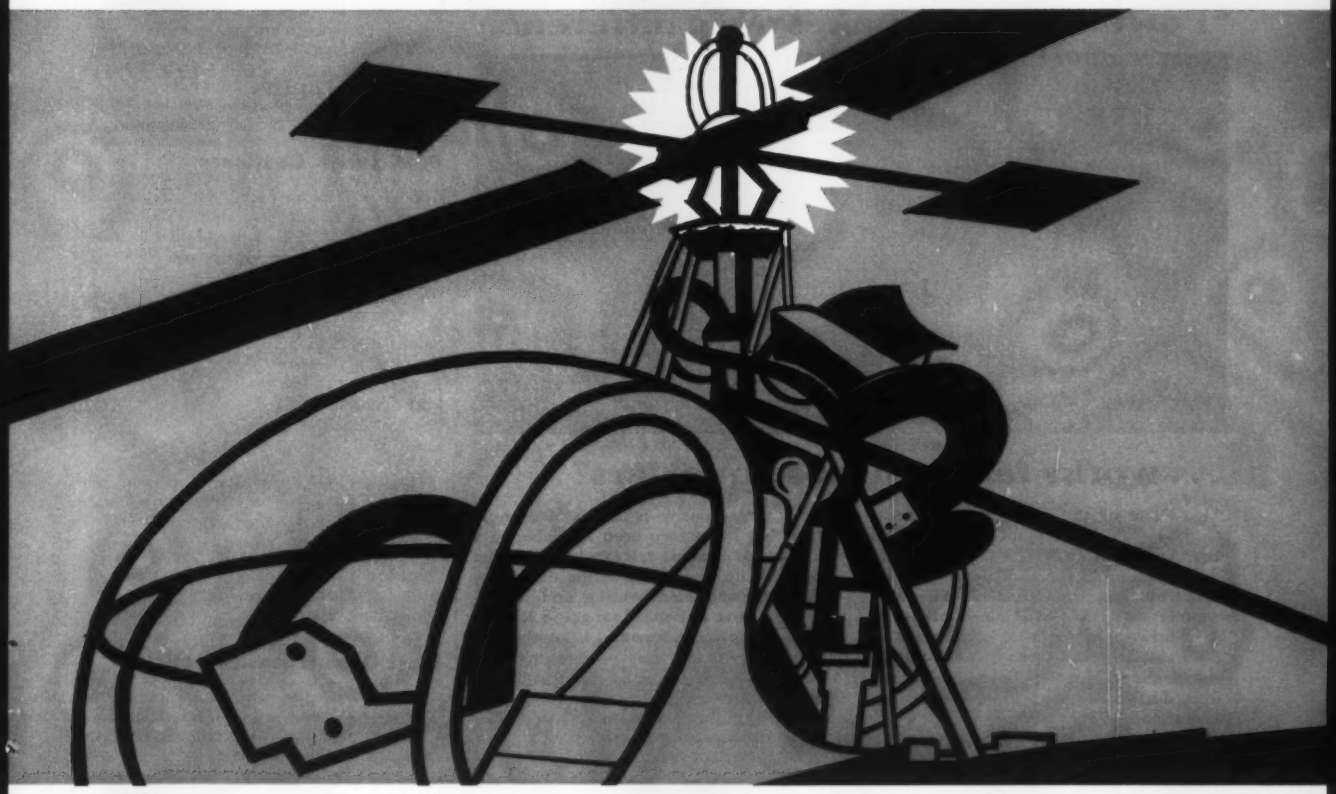
3. Due to rapidly increasing technology and obsolescence, replacements must be made at modern cost.

In view of these conclusions, I believe the double-declining balance method allowing 20 per cent maximum declining balance depreciation charge per year is

(Please turn to Page 12)

ANOTHER NEW
AIRCRAFT COMPONENT
MADE OF BYERS
AMBALLOY STEEL

AMBALLOY HIKES CAPABILITIES OF VITAL PARTS



How technically competent is your source of aircraft quality steels? Byers Amballoy steel users are served by trained metallurgists. Amballoy is uniform in workmanship, quality and cleanliness. Amballoy cuts rejections, improves product performance, meets exacting requirements.

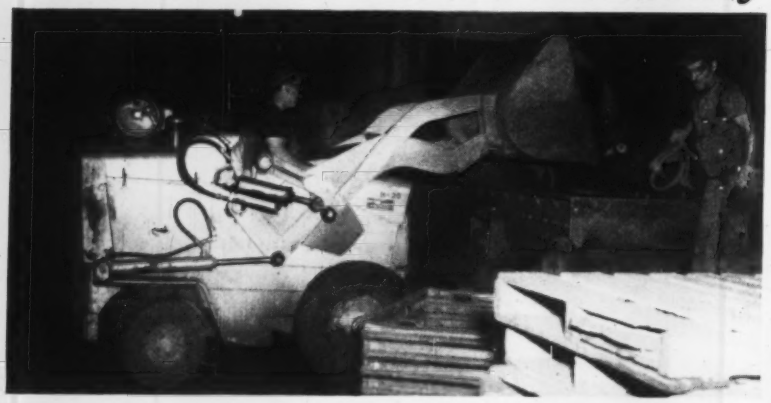
Evaluating materials for ultra-critical aircraft and missile applications? Consider Amballoy. Byers high-quality specialty steels boost performance of gear blanks, motor hubs, upset sections, tension rods, screw shafts, steering knuckles, piston assemblies, high stressed latch and catapult hooks, flanges, and gusset plates. Versatile Amballoy is increasing payload factors in scores of longitudinally and transversally loaded parts. For details, write: A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

Mighty mite. This straight bevel gear for power unit of Hiller Helicopter has a workhorse assignment demanding plenty of strength and stamina. Made of AISI-E 9310 Byers Amballoy Steel to Specification AMS 6260E at Vard, Inc., Pasadena.

aircraft quality steels from a technically competent source

A. M. BYERS COMPANY

PAYLOADER® maneuverability



"Power-steering makes a big difference

. . . works faster in close quarters"

That's one of the significant comments of J. T. Williams, plant manager and Edwin Daugs, "PAYLOADER" operator, of Grede Foundries Inc. at Reedsburg, Wis., concerning their model H-25. This Milwaukee company, with seven plants in the Midwest, has enjoyed many years of profitable experience with "PAYLOADER" tractor-shovel use in their steel, gray iron, ductile iron and alloy iron casting operations.

The Reedsburg product is ductile iron and its Model H-25 has important duties there day and night. It breaks the molds on the floor, then picks up sand and castings and delivers them to the shakeout. It takes used sand to the muller and delivers 30-35 loads of reconditioned sand per hour to the molding stations . . . also hauls limestone and coke.

Power-steering is one of the many features of the new H-25 "PAYLOADER" that makes it more productive. Its 2,500 lbs. carry capacity is 25 to 50% more than has heretofore been available in a 6-ft.-turning-radius tractor-shovel. It has power-shift transmission for fast, easy shuttling and maneuvering and including exclusive two-speed ranges in reverse. Power-transfer differential is another exclusive in its size class — a feature that transfers more power to the other drive wheel when one of them gets on slippery or loose footing. It reduces wheel-spinning, time-wasting inaction.

Your Hough Distributor is ready to show you all the other superior advantages of the new Model H-25 — why it is the most productive and most durable tractor-shovel anywhere near its size.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
876 Sunnyside Ave., Libertyville, Ill.

☐ Send H-25 PAYLOADER data.
☐ Other PAYLOADER models.

Name _____ Title _____

Company _____

Street _____

City _____

State _____

3-A-2

LETTERS

(Concluded from Page 10)

the best compromise to date. This method enables industry to obtain funds more quickly to meet the demands of growth, inflation, and technology, and is still controllable within the range of broad economic control.

Regardless of the future of depreciation allowances, I remain a faithful weekly reader.

Louis Price

Camden, N. J.

• • •

We are interested in the depreciation policies recognized by our government, and the need for revision to reflect present day business financing.

Will you mail us a copy of this article?

C. E. Remey

Riordan Machinery Co.
Detroit

PFM Series Continues

Will you please send me six copies of "Profile of Metalworking's Managers" (Feb. 16, p. 137)? I would like to distribute them to our key people.

I am glad to see you are continuing this outstanding series in 1959.

A. L. Duggan

Sales Promotion &
Advertising Manager
Edward Valves Inc.
East Chicago, Ind.

• • •

Congratulations on your Program for Management series! Will you send me three copies of the first article?

Charles G. Beavers Jr.

President
Brubaker Tool Corp.
Millersburg, Pa.

Most Comprehensive Article

Please send me two copies of "How To Select Power Brushes" (Feb. 9, p. 80).

Of all the many articles which have appeared on brushing, this is by far the most comprehensive. Congratulations.

E. H. Forsstrom

Process Engineer
Allegheny Ludlum Steel Corp.
Brackenridge, Pa.

Seeks Report

In "Incentives: Challenge to Managers" (Feb. 9, p. 52), you mention the National Industrial Conference Board's *Management Record*, October, 1957. I would like to receive a copy of this issue.

Wm. E. Hendricks

Executive Vice President
Belmont Iron Works
Philadelphia

• *Write to E. A. Hammesfahr, NICB, 460 Park Ave., New York, N. Y.*

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LOWER YOUR COSTS . . . IMPROVE YOUR PRODUCT
. . . with Selas Automatic Heat Processing

ANNEALING: Incorporating a continuously rotating six-station dial conveyor, this Selas automatic machine anneals a narrow band on stainless steel auto hub caps. Workpieces rotate above a ring of Superheat burners, bringing 2-in. wide band to 1800°F in 30 sec. Production is 600/hr, with one operator loading and unloading. Measuring only 6 ft 6 in. in diam, this compact unit is located directly in the press shop production line.

Selas automatic machines are extensively used for production heat processing operations, including annealing, heat treating, brazing and soldering, forging and localized hardening.

The installations shown on these pages demonstrate how Selas automatic heat processing equipment can:

- increase production speed
- save fuel and operating costs
- minimize in-process inventory
- reduce manpower requirements
- save valuable floor space
- improve product quality

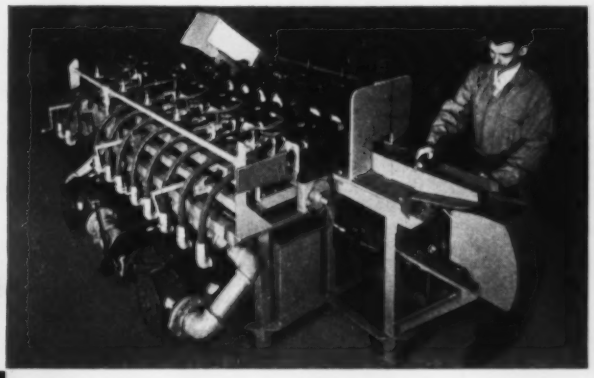
Individually designed and custom-built to meet your specific production requirements and job specifications, Selas automatic machines employ time-proven standardized engineering features for longtime operating dependability and minimum initial cost. In addition, you avoid problems usually associated with divided responsibility since Selas starts-up and services every machine it designs and builds.

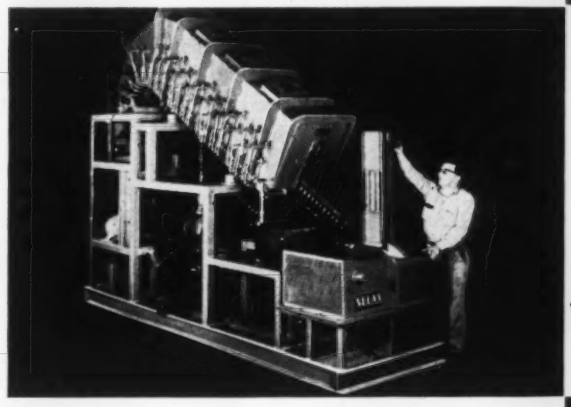
A Selas automatic machine can prove beneficial in your plant. At your convenience . . . without cost or obligation to you . . . a Selas field engineer would welcome the opportunity to survey your needs.

For this personal service—or for literature on any of the heating operations shown on these pages—address Dept. 23, Selas Corporation of America, Dresher, Pa.

SUBSIDIARIES: Selas Constructors, Inc., Houston, Texas; Selas Corporation of America, European Div., S. A., Pregny, Geneva, Switzerland.
INTERNATIONAL REPRESENTATIVES AND LICENSEES: BENELUX, FRANCE—Cie Gle de Construction de Fours, Paris; CAMBODIA, FORMOSA, KOREA, LAOS, VIETNAM—Cosa Export Co., Inc.; AUSTRIA, GERMANY—Indugas, Essen; JAPAN—International Machine Co., Ltd., Tokyo; ITALY—Italiana Gasogeni E. Forni S.r.l., Milano.

LOCALIZED HARDENING: Selas automatic machine heats, quenches and tempers both faces of sledge-hammer-heads in a continuous operation. Tempering, which previously required hours, is now performed in minutes. Machine handles wide variety of sizes, shapes and weights . . . production rate of a typical 8-lb head is 100 per hr. By integrating the heat-treating function with the preceding grinding step, there is no additional labor cost involved in the operation of the machine.





FORGING: This continuous Selas unit fits compactly into the production line to heat alloy steel bars for forging into C-shaped rail anchors. Production is synchronized with the forging bulldozer, at rates up to 620 bars per hr. Inventory of work-in-process is ⅓ to ¼ of previous equipment . . . 20% less floor space is occupied . . . 95% less scale is formed. Only two operators required for entire process—one to load heating machine, one to operate forge bulldozer. Precise heating assures consistently uniform grain structure and hardness, piece after piece.

HEAT TREATING: 400 motor rotors are heated per hr to 900°F in this automatically controlled machine for: (1) developing electrical and torque characteristics, (2) shrink-fitting on rotor shafts, (3) bluing the outer surface of the turned laminations. With steel and aluminum involved, close temperature control is achieved to avoid melting the aluminum. Machine occupies only 6 ft square floor space . . . replaces gas torch heating units requiring up to 10 times as much fuel, or low-temperature ovens requiring hours of heating time.

BRAZING: A Carboloy cutter is silver brazed to a stainless steel shredder ring used in garbage disposal units, with this compact Selas machine. Precise fixturing, localized high-speed heating and automatic unloading permits one operator to produce up to 200 pieces per hr . . . every piece to pass a 3000-lb load test. Completely shop-assembled at Selas, the package unit was installed in customer's plant, ready for production operations, within hours.

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CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers

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*temperature indicating crayons**

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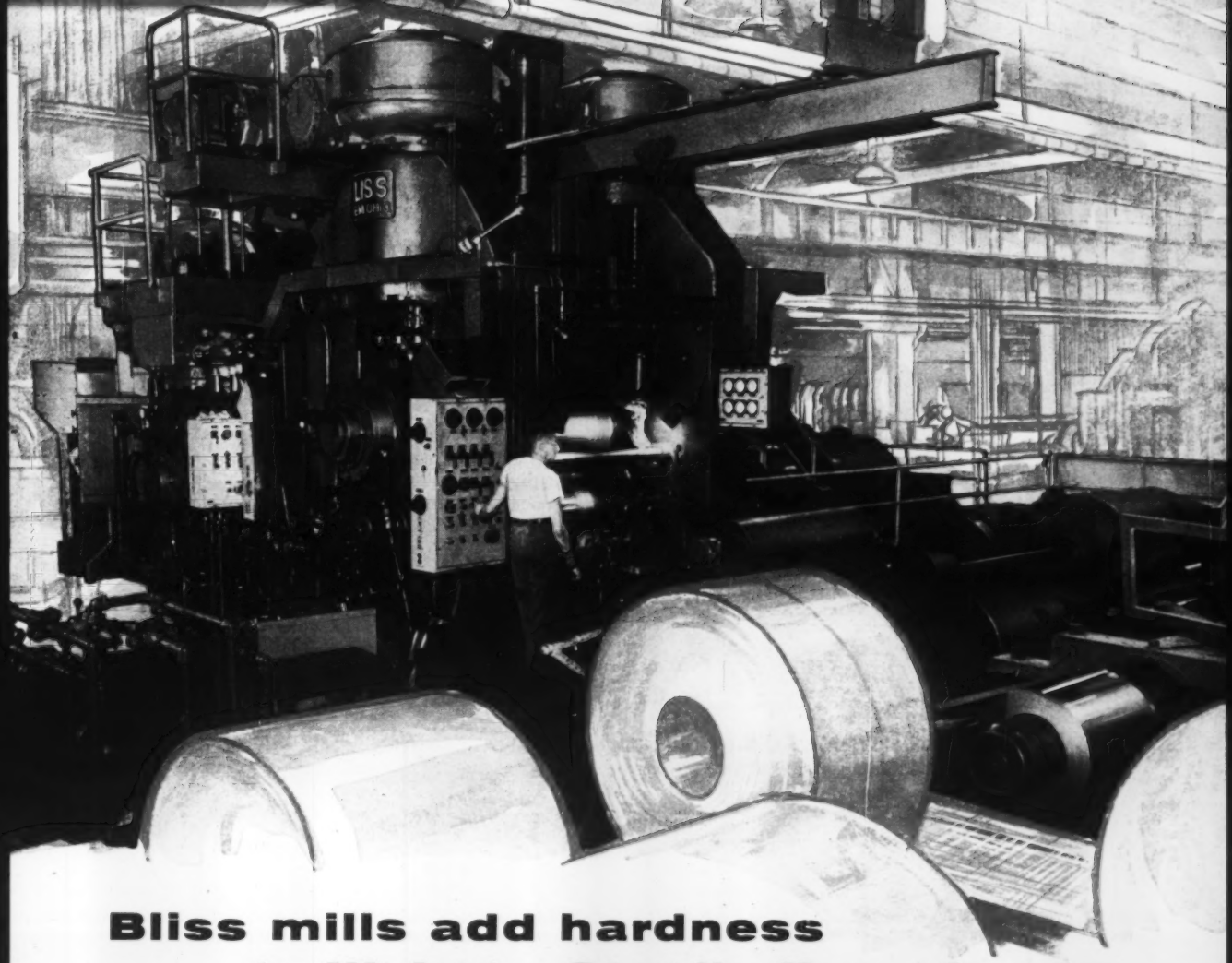


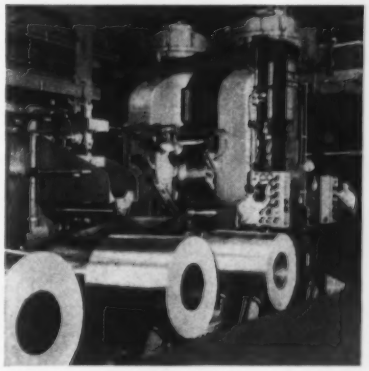
Bliss mills add hardness to Weirton Steel's line of strip

Weirton Steel Co., Division of National Steel Corp., the nation's largest independent producer of tin plate, uses a Bliss mill to achieve exacting temper and quality of its strip prior to plating. It is a four-high, two-high two stand tandem mill recently installed in its Weirton, W. Va., plant.

Through this unit Weirton has rolled a wide variety of steels in gages ranging from .00435 to .0147 inches and at an average maximum speed of 4,500 feet per minute. Well known products such as Weircote and Weirzin zinc coated steel are just two of Weirton's steel products to which this mill contributes.

A second Bliss mill tempers high-carbon, high-phosphorous, deep-drawing and galvanizing steels at the rate of 800 tons a day, while a new Bliss 48-inch slitting line is used to slit galvanized steel in gages from .0135 to .135 inches at speeds of 200 to 1,000 fpm. Both rolling mills are equipped with Amerigear-Bliss spindles.

These three installations provide one more example of the ready acceptance of the name of Bliss in the rolling mill industry—both here and abroad. To learn how Bliss equipment can help increase your rolling capacity, simply write for our new 84-page Rolling Mill Brochure, Catalog 40-B.



Four-high temper mill handles 30,000-lb. coils at speeds up to 3,500 fpm...has rolled 1,000 tons in a single day. Back-up rolls were supplied by Bliss' Mackintosh-Hemphill Division.

BLISS
SINCE 1857

Bliss is more than a name . . . it's a guarantee

E.W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

THE MARK OF QUALITY

BARBER COLMAN

Wheelco Instruments

Built-in leadership—

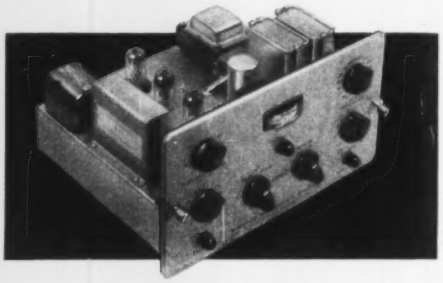
No need to wait . . . get with "field-proved"

There's no need to wait for new designs or hold up a recorder purchase until you're sure that the features you've heard about really work. Wheelco potentiometer recorder controllers — whether circular or strip chart — have the features you want *right now.*

Why settle for less when Wheelco recorder controllers offer you all these as standard — *at no extra cost:*

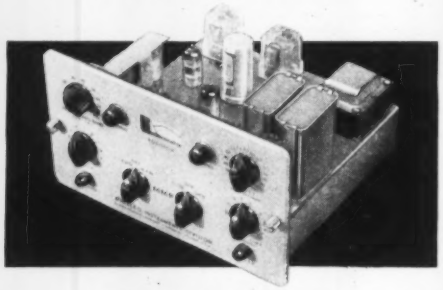
1. **CONSTANT VOLTAGE SOURCE** — proved in more than three years of field operation and available at no extra cost. Silicon diodes eliminate batteries and standard cells.
2. **QUICK RANGE CHANGE** — no soldering, just loosen 5 screws to replace range change brackets.
3. **PLUG-IN COMPONENTS** — downtime is sharply reduced and repairs can be made without tying up equipment with Wheelco pioneered plug-in components.
4. **ACCESSIBILITY** — inspection, adjustment and cleaning of complete instruments are simplified. Swing-out design

MM SERIES CONTROLLERS FOR PROPORTIONAL RESET AND RATE ACTION



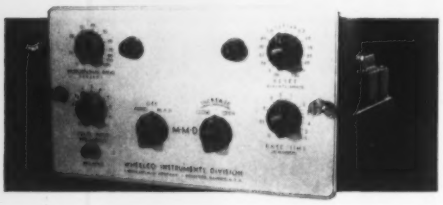
MMC CURRENT OUTPUT TYPE

Flexible in adaptation to final control elements including saturable reactors, electropneumatic transducers, electrohydraulic transducers; as well as other compatible electric systems.



MMP POSITION TYPE

Can operate a valve, valve positioner or other positioning device. Reset action is adjustable from 0.6 to 100 repeats per minute, rate action from 0 to 5.5 minutes.



MMD DURATION TYPE

Regulates input by adjusting on-time of a contactor on either electrical or fuel-fired installations. Ideal when upsets are fast and recovery slow or when large and frequent.

MP PROPORTIONAL POSITIONER

Mounts in the instrument, provides proportional control by modulating the position of final control element as a linear function of the value of the measured variable.

the recorders

advanced design

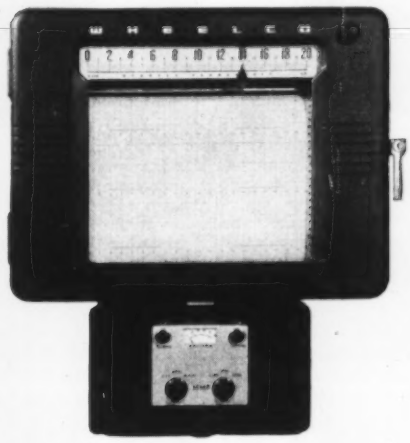
of principal elements on all Wheelco recorders permits fast adjustment, chart change, etc.

5. SIMPLE CHANGE OF BALANCING SPEEDS — changing a 15-second recorder to a 2-second recorder requires removing 3 steps of gearing. The two-phase balancing motor remains the same for all speeds.

ALSO FIELD-PROVED CONTROL FORMS WITH EXCLUSIVE MAGNETIC MODULATORS — Proportional rate and reset action on round and strip chart instruments offered by MM series controllers of the current output, position, or duration type.

SERIES 2000
ROUND CHART RECORDERS AND RECORDER CONTROLLERS

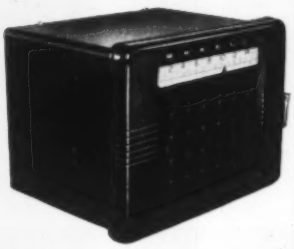
are also self-contained, null-balancing potentiometer instruments, the newest in the Wheelco line. Pen speeds are 1, 4, or 20 seconds at 60 cycles a-c. The 12-in. diameter chart has a calibrated width of 4⅝ in. Instrument accuracy is ± ¼ of 1% for all scale spans of pyrometric range. External control point setters are optional. All standard chart speeds are available; also a complete range of control forms including three-function type.



SERIES 8000
RECORDERS AND RECORDER CONTROLLERS

Self-contained, null-balancing electronic instruments designed for long life and trouble-free service. Wide range of models provides for measurement, indication, control, and permanent recording of temperatures and (with transducers) other variables such as speed, strain, ph, and any other quantities that can be resolved into electrical signals. Multipoint recorders handle up to 24 points at speeds from 3 to 24 inches per hour. Multibank (scanner) setups permit recording 144 or more points. Shown at left is recorder controller with automatic reset in tamperproof cover.

Rounding out the Wheelco line



Wheelco 9000 Series multiswitch indicators enable rapid checking of temperatures at as many as 108 stations. More stations require only an additional switch housing cabinet.

Circular scale 3000 Series indicators and Indicating Controllers have large, bold, distant-reading scales and generally parallel construction of 2000 Series recorders described above.

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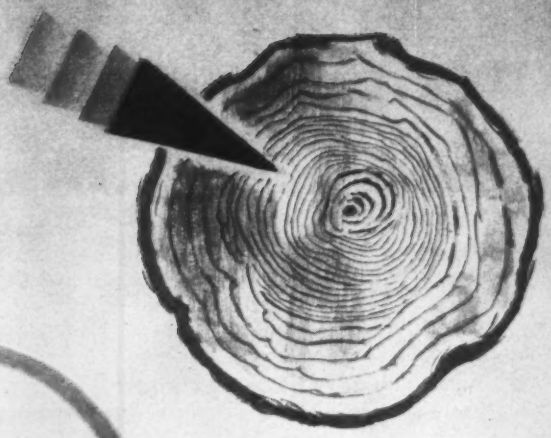
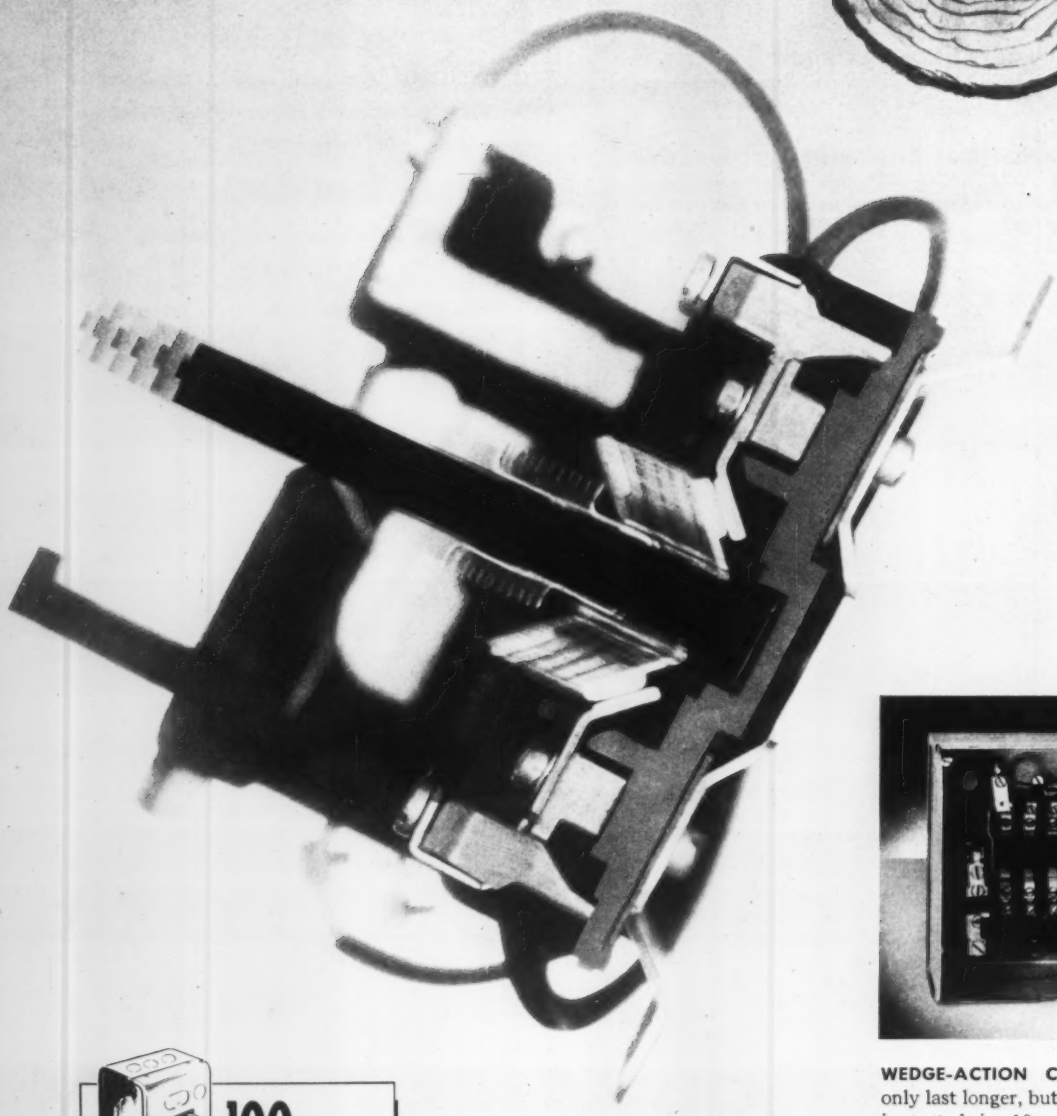
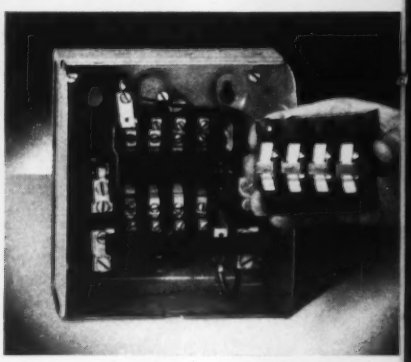
Exclusive G-E "wedge-action" contact design

JUST AS A WEDGE DRIVEN INTO A LOG is held tightly by pressure . . . the wedge-action contacts of G-E 100-Line magnetic starters move into position with ***less bounce.*** Result: less arcing and longer contact life.

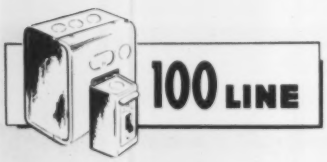
CROSS-SECTION CUTAWAY ENLARGED APPROXIMATELY 30%







WEDGE-ACTION CONTACTS not only last longer, but can be visually inspected in 10 seconds ***without*** tools. Contact maintenance is thus held to the minimum.



contributes to G-E 100-Line magnetic starters'...

BETTER PERFORMANCE

The basic function of a magnetic starter is simply to open and close contacts. The better it performs this function, the greater its reliability. Here's why General Electric's 100-Line starter contact design gives you *better* contact fidelity and *longer* contact life:

POSITIVE "MAKE"—wedge-action contacts can move only forward and back; lateral movement is virtually impossible. This assures perfect contact alignment, positive "make," and longer contact life.

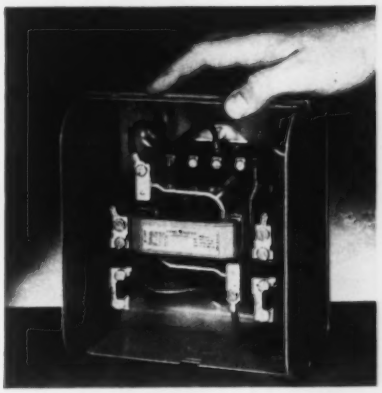
LESS BOUNCE—less armature mass and spring-loaded contacts that absorb the shock of contact mean minimum bouncing or arcing—the major cause of contact failure. Spring-loaded contacts also help prevent contact welding and assure high tip pressure.

POSITIVE "BREAK"—contact springs and a low stress "kick-off" spring in the contact arm assure fast, positive break.

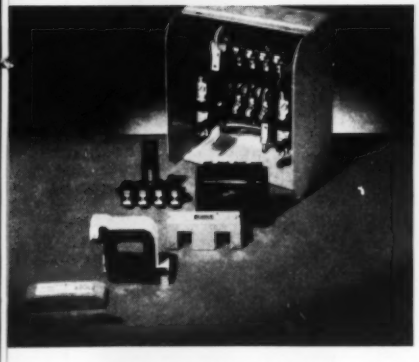
LESS CONTAMINATION—because of their vertical slant design, G-E 100-Line starter contacts shrug off dust and dirt—help keep starter performing better.

FOR BETTER PERFORMANCE AND LESS MAINTENANCE, specify G-E 100-Line magnetic starters—Sizes 0 and 1. Call your G-E Apparatus Sales Office or Distributor, or write Section 733-44, General Electric Co., Schenectady, N. Y.

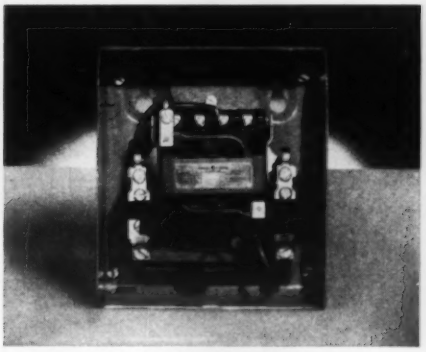
GENERAL ELECTRIC



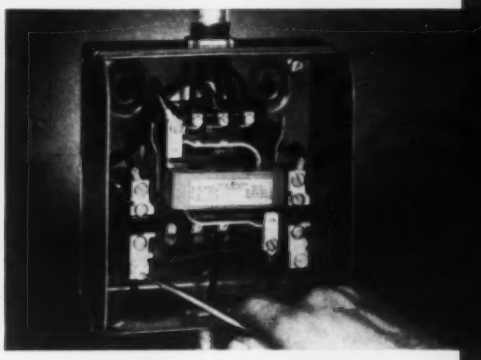
GENERAL ELECTRIC 100-LINE STARTERS are available in Sizes 0 and 1 with a wide variety of forms and enclosures.



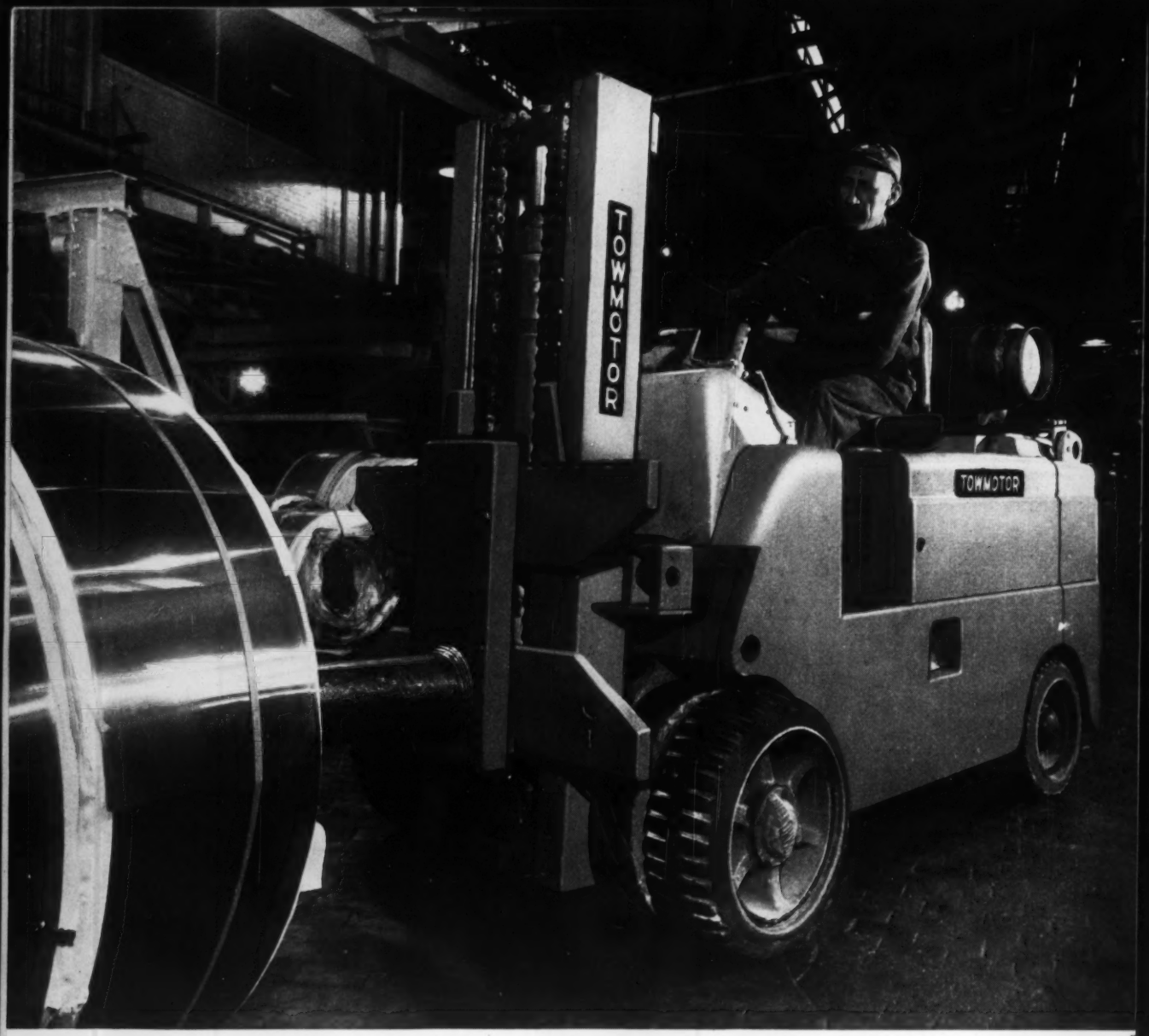
SNAP-SLIDE CONSTRUCTION permits complete starter disassembly in 20 seconds without tools. All operating parts either snap or slide together for maximum accessibility.



32% MORE WIRING ROOM makes the G-E 100-Line starter easier to wire, even though it's smaller in size than previous forms. Wrap-around cover adds extra accessibility.



STRAIGHT-THROUGH WIRING with line terminals on top and load terminals on bottom saves wiring time. All wiring is done from front, and no wires need be bent or looped.



New Towmotor "Pace-Maker" Model Fork Lift Truck

Sets pace for fast flow!

Watch agile Towmotor lift trucks keep multi-ton loads flowing through busy, congested mills and factories—and you'll know why they lead the way in materials handling. Notice the fast pace they set for *every department* as they hustle all types of materials through receiving, production and shipping.

Discover why Towmotor lift trucks have the tough-as-nails stamina for *continuous operation*—cutting handling costs to bedrock day after day. Ask for new "Pace-Maker" Booklet SP-23 . . . and Certified Job Studies applying to your specific handling operations. (Also ask about new foot-controlled *Towmostatic Drive*, available now on some Towmotor models.) Write Towmotor Corporation, Cleveland 10, Ohio.

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BOOTHS 1302-1307-1404

TOWMOTOR THE ONE-MAN-GANG® **-GERLINGER**

LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

CALENDAR
OF MEETINGS

Mar. 23-24, American Management Association: Special manufacturing conference on integrated materials management, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Manufacturing division's manager: Clifford J. Craft.

Mar. 24-25, Institute of Printed Circuits: Annual meeting, St. Moritz Hotel, New York. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

Mar. 31-Apr. 3, Society of Automotive Engineers: National aeronautic meeting and production forum, and aircraft engineering display, Hotel Commodore, New York. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Apr. 1-2, National Industrial Conference Board Inc.: General session for all associates, Ambassador Hotel, Los Angeles. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Apr. 1-3, Gas Appliance Manufacturers Association: Annual meeting, Americana Hotel, Miami Beach, Fla. Association's address: 60 E. 42nd St., New York 17, N. Y. Secretary: Harold Massey.

Apr. 2-3, Metallurgical Society of AIME: Conference on physical metallurgy of stress-corrosion fracture, Mellon Institute, Pittsburgh. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Apr. 5-8, National Association of Waste Material Dealers Inc.: Annual convention, Edgewater Beach Hotel, Chicago. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Apr. 5-10, American Chemical Society: Annual meeting, Boston. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

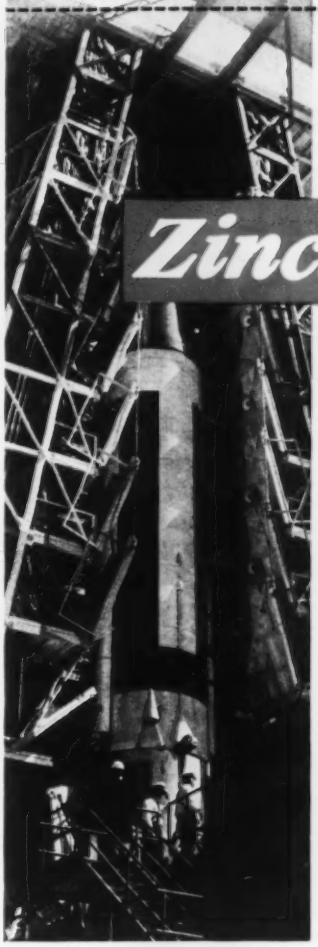
Apr. 5-10, Nuclear Congress and Atomfair: Public Auditorium, Cleveland. Coordinator: Engineers Joint Council, 29 W. 39th St., New York 18, N. Y. Secretary: E. Paul Lange.

Apr. 6-8, American Hot Dip Galvanizers Association Inc.: Annual meeting, Empress Hotel, Miami Beach, Fla. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Apr. 8-10, National Industrial Conference Board Inc.: Annual conference on atomic energy in industry, Hotel Statler-Hilton, Cleveland. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

WEBSTER

gal-va-nize (găl'və nīz'), *v.t.* 1. to simulate by or as by a galvanic current. 2. to coat (metal, esp. iron or steel) with zinc.



U. S. AIR FORCE PHOTO

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Zincilate® *available now low-cost fast • easy*

TRUE GALVANIC PROTECTION for IRON, STEEL and ALUMINUM

PROVED SUPERIOR in EXPOSURE TESTS

MEETS or EXCEEDS MILITARY (MIL-P-26915) and F.H.A. GALVANIZE STANDARDS (UM-24A)

EASILY APPLIED, SAVES TIME, MATERIALS and MANPOWER

FOR PRODUCTION LINES and MAINTENANCE WORK

NO PRE-TREATMENT REQUIRED for REPAIR of HOT-DIP GALVANIZE

Zincilating is the modern way to provide complete, lasting galvanic protection to iron, steel and aluminum.

Zincilate makes it possible to fully galvanize any product or structure, regardless of size or shape—no limitations due to tank capacities.

Zincilate may be applied anywhere, in your own plant or at the installation, using only standard equipment and spray, brush, dip or flow-coat methods—no costly, time-wasting trips to and from the galvanizing plant.

Zincilate may be applied anytime, before, during or after fabrication and assembly—no warpage or embrittlement and no loss of protection from shaping, forming, drilling, etc. And Zincilate is fully weldable, right after application, or months later.

Zincilate comes in a single container, requires no mixing or special preparation. Uncoated material to be protected requires only the simplest degreasing; galvanized material needs no pre-treatment.

Zincilate has already replaced expensive, inconvenient old galvanizing methods, and costly, time-consuming multi-coat systems, on a complete range of military and commercial applications. For complete information, please call or write, outlining your use of galvanize. We'll reply with facts and without obligation to you.

PROTECTION that SELLS your PRODUCTS

INDUSTRIAL METAL PROTECTIVES

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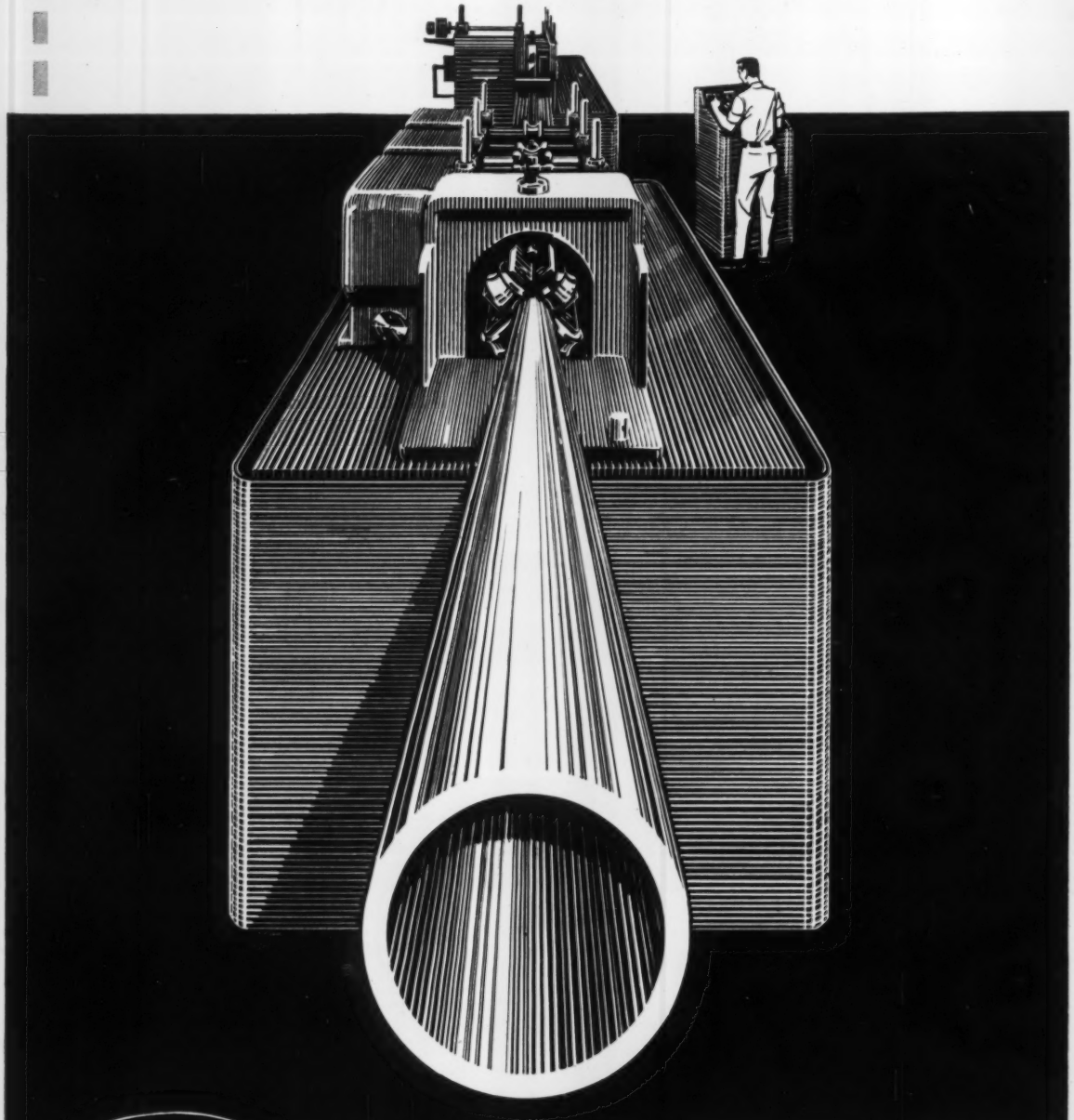
Pipe and Tube Mills—Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition. Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Pipe and Tube Mills Book.

THE YODER COMPANY • 5502 Walworth Avenue • Cleveland 2, Ohio



ENGINEERING **YODER** MANUFACTURING

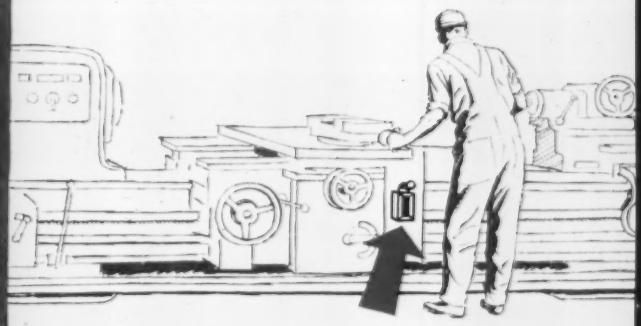
PIPE AND TUBE MILLS (ferrous or non-ferrous)

COLD ROLL FORMING MACHINES
ROTARY SLITTING LINES

ALLEN-BRADLEY

REVERSING DRUM SWITCHES

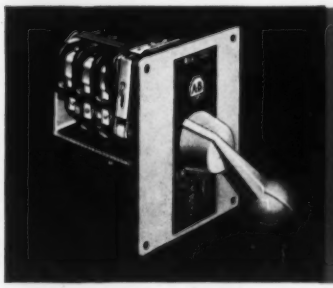
BULLETIN 350
Style A wrap-around cover is removed to show the readily accessible front wiring terminals. Max rating: 2 hp.



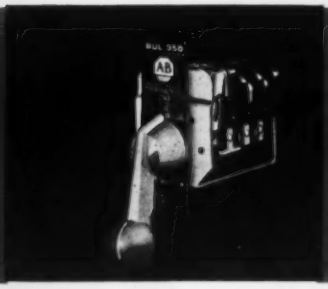
...styled to match the most modern production machines!

Inside and out—this Allen-Bradley drum switch is *all* new. Its trim, modern lines and attractive die-cast aluminum handle will give your production machines "up-to-the-minute" styling.

But there is more than beauty to this new switch. The rugged switch mechanism is a self-contained unit—independent of the enclosure. Misalignment and binding *cannot* occur. The base mounts directly on machine surfaces—without using spacers. And with the wrap-around cover removed, terminal screws are exposed for fast wiring—from the front. Changeover from momentary to maintained contact operation can be made in seconds. Investigate this new "leader" in its field. Send for Publication 6091.



OILTIGHT CAVITY MOUNTING
A-B Style AF reversing switches can be furnished with sealed shaft and rubber-gasketed, oiltight cover for cavity mounting in a machine base.



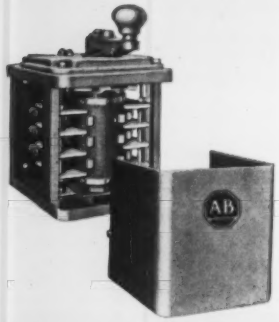
PANEL MOUNTING
The new Style A switches can be furnished for mounting directly on panels. Nameplate which gives ratings is also included with each switch.

ALLEN-BRADLEY

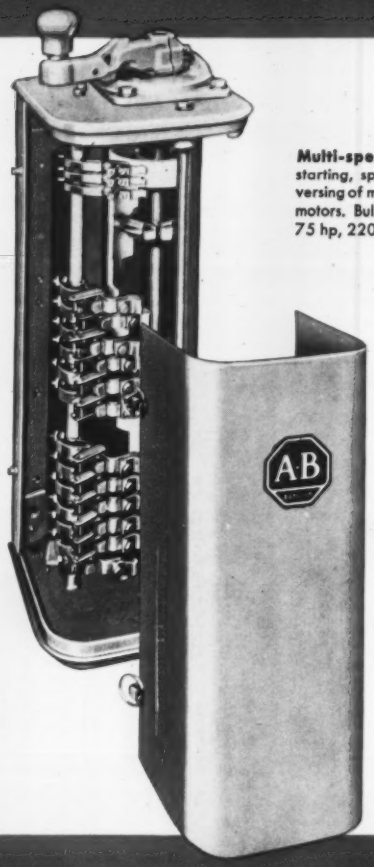
Quality Motor Control

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

3-59-MR

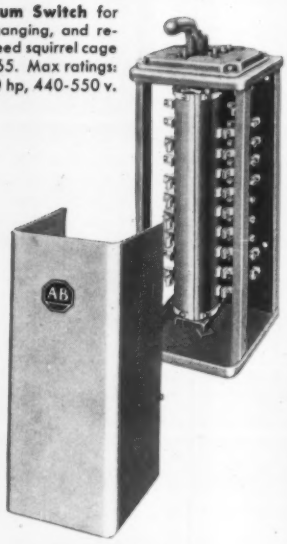


Reversing Drum Switch for across-the-line starting and reversing a-c and d-c motors. Interlocks available. Bulletin 350. Max ratings: A.C. 20 hp, 220v; 40 hp, 440-550v. D.C. 3 hp, 115-230v.



Speed Regulating Drum Switch for starting and regulating duty of wound-rotor motors. Bulletin 375 non-reversing. Max ratings: 500 hp, 220-440-550 v. Bulletin 385 reversing. Max ratings: 60 hp, 220 v; 75 hp, 440-550 v.

Multi-speed Drum Switch for starting, speed changing, and reversing of multi-speed squirrel cage motors. Bulletin 365. Max ratings: 75 hp, 220 v; 150 hp, 440-550 v.



A-B QUALITY

For years of dependable performance

ALLEN-BRADLEY DRUM SWITCHES

have no equal!

These Allen-Bradley drum switches provide simple and economical control for alternating current motors. Although low in cost, these unusually rugged switches are built under Allen-Bradley standards of *quality* . . . your assurance of reliable, trouble free performance. And this broad line of drum switches offers a variety of mounting types, operating handles, and interlocks to satisfy practically every requirement. Let us send you details on this versatile line of drum switches.

ALLEN-BRADLEY

Quality Motor Control

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

3-59-MR

A 3M Case History Report

STEEL POLISHING SPEEDED 10–15% WITH "PG" WHEELS

MANUFACTURER: Heintz Division of Kelsey-Hayes Co.

ADDRESS: Philadelphia, Pennsylvania.

PRODUCT MANUFACTURED: Automotive Metal Stampings.

3M ABRASIVE USED: "PG" Wheels.

HOW 3M ABRASIVES ARE USED: Finishing operation. Remove die marks, scratches, and other forming defects from cold-rolled carbon steel auto grille bars, prior to plating.

OPERATIONAL DATA ON 3M METHOD: Grit 220 Resin Bond Cloth "PG" Wheel on double-spindle floor lathe with buff-wheel.

OPERATIONAL DATA ON PREVIOUS METHOD: 2-station, 3-step method. 1st, #120 disc; 2nd, set-up wheel; 3rd, buff-wheel.

PROVEN ADVANTAGES OF 3M METHOD: Former 3-step operation reduced to 2 steps; "PG" Wheel and Buff. "PG" Wheel leaves no scratches on work piece; speeds production 10-15%.

OTHER 3M ABRASIVE PRODUCTS IN USE: "Three-M-ite" Resin Bond Cloth Portable "PG" Wheels on hand-grinders are used to remove in-use scratches, other imperfections from dies, without removing them from press. "PG" Wheels replaced hand methods, reduced repair time from 14 hours to 30 minutes.

WANT MORE INFORMATION? Send for free manual, "Modern Metal Finishing with 3M 'PG' Wheels." Write to 3M Co., St. Paul 6, Minn., Dept. GJ-39.

"PG" Wheels are manufactured in U.S.A. by 3M Company, St. Paul 6, Minn. Export: 99 Park Avenue, New York. Canada: London, Ontario

WE RECOMMEND
How to use coated abrasives to cut costs, improve production, shown in the new 426 page book
COATED ABRASIVES
MODERN TOOL OF INDUSTRY
At bookstores or McGraw Hill, N.Y.

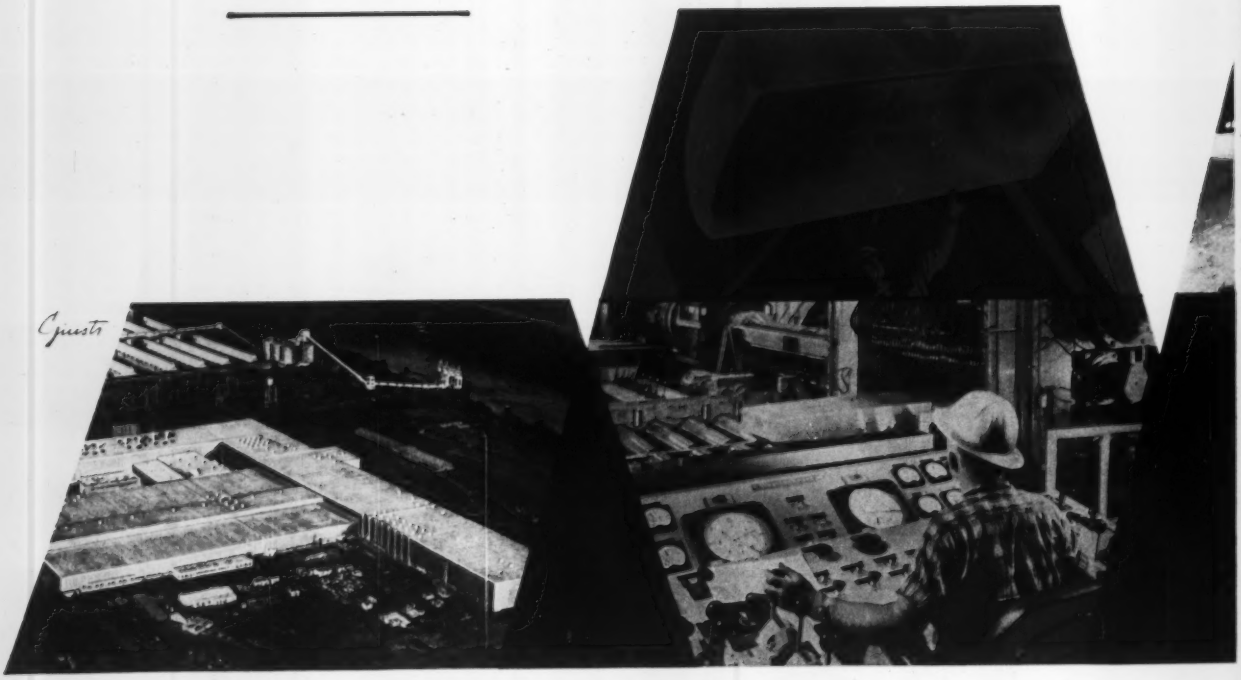
3M Coated Abrasives

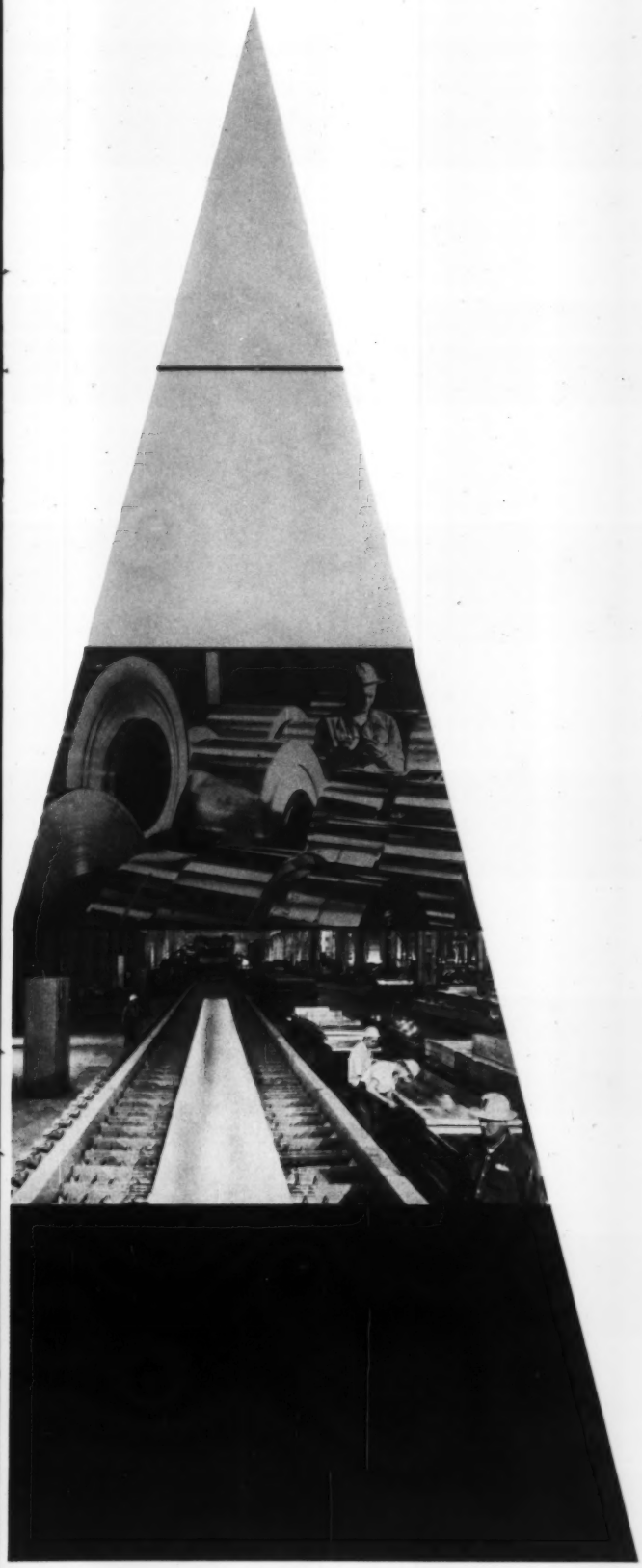
"PG" WHEELS

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY





Olin Aluminum hits a new high in quality and service

Olin Aluminum, the nation's newest major producer, has earned in two short years a key role as a basic supplier of metal in the automotive, construction, transportation and consumer durables fields.

Vast tonnages of sheet, coil, extrusions, rod, bar and casting alloys are now flowing into the top-quality lines of the country's leading manufacturers.

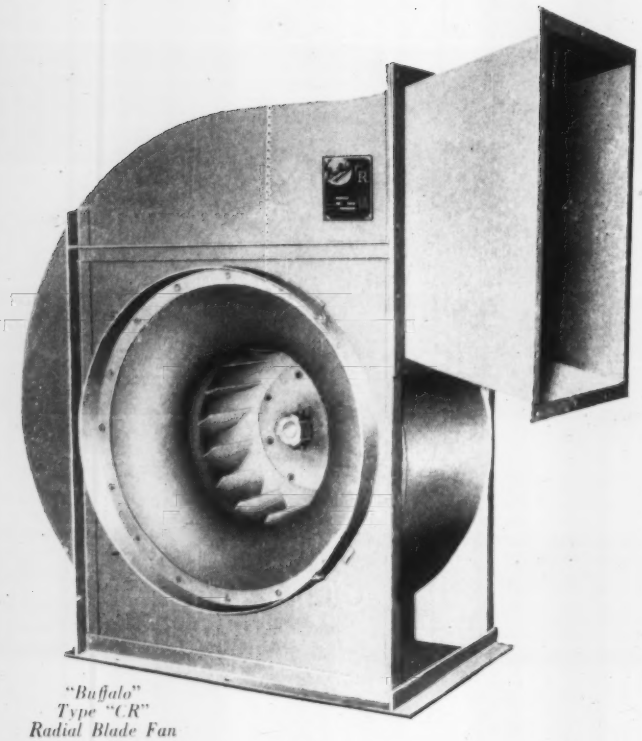
Olin Aluminum is fast gaining special recognition for the unusually high quality of its personalized service. Equally important, product quality is rigidly controlled from bauxite mining to your production line.

Our experienced staff of highly trained specialists welcomes the chance to give you individualized, detailed service. Call your nearby Olin Aluminum Sales Office or Authorized Distributor.

Metals Division, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, N. Y.

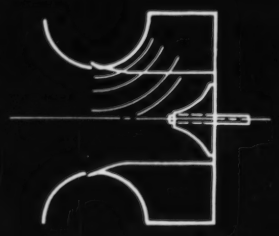
OLIN ALUMINUM

® AND "OLIN ALUMINUM" ARE TRADEMARKS



"Buffalo"
Type "CR"
Radial Blade Fan

Gradually divergent outlet minimizes turbulence . . . obtains peak static pressure conversion. Result is reduced housing wear, increased efficiency.



Design of the deep die-formed inlet and wheel flange reduces abrasion to a minimum. Mating sections form a true half-circle with no irregularities. Resultant smooth air flow reduces wear, provides top performance.

ABRASION RESISTANCE OF "CR" FAN REDUCES MAINTENANCE-REPLACEMENT COSTS

Where you need a high volume, high pressure fan that will stand up under the most severe heavy-duty industrial jobs, especially where abrasion is a problem, the "CR" will give you the most for your fan dollar.

The "Buffalo" Type "CR" Fan's superior design, heavy gauge construction and painstaking workmanship insure optimum performance during a long life of dependable service. Its high capacity characteristics often permit substitution of a smaller fan for many direct-connected applications. This can save many dollars on initial fan costs.

The "Buffalo" Type "CR" Fan offers many advantages for your most punishing air moving applications. Contact your nearby "Buffalo" engineering representative, or write for Bulletin FD-205.

"Buffalo" Fans give you the exclusive "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

"Buffalo"

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Buffalo, N. Y.

Buffalo Pumps Division, Buffalo, N. Y.
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NEW PRODUCT ISSUE

Stuart

Productive Lubrication

FOR PROFIT-MINDED PRODUCTION MEN

VOL. 1, NO. 3

MARCH-APRIL 1959

new

Stuart's HI-D* trims hidden costs on grinders at Torrington Bantam Bearing Division

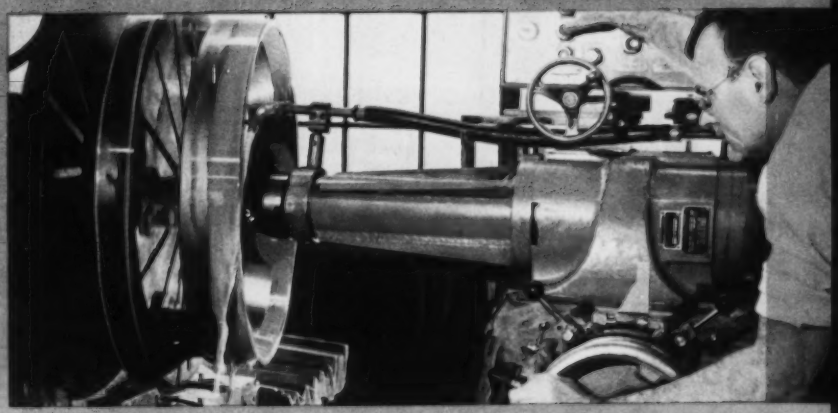
Proves high-detergency grinding fluid can be a flexible cost-reduction tool

This precision roller bearing manufacturer has found out what it takes in a grinding fluid to uncover hidden savings like these:

1. Less downtime for wheel dressing and cleaning machines.

2. Longer wheel and diamond life.

The people at The Torrington Company, Bantam Bearing Division, South Bend, Indiana, diligently tested Stuart's new HI-D in a quest for mastery of chips and heat that determine wheel performance and work quality. They put it through its paces against six tough candidates to find the one best fluid for the average condition on 87 grinders—one that would perform most efficiently in their Hoffman flotation-type filter.



On machines like this universal gap grinder, wheels can remove .030" before dressing; whereas, previous coolants made dressing necessary at .010".

We were delighted, but not surprised, when Stuart's HI-D took top honors for both performance and economy. The reason is not too baffling. A new petrochemical detergent in Stuart's HI-D does a yeoman's job of keeping grinding wheels free-cutting. And in our opinion, the use of good "chemical soaps" for washing the fine hair-like chips from between the grits of a grinding wheel is a factor that deserves plenty of appraisal nowadays.

Torrington's efforts paid off. Today, wheels require dressing only ⅓ as often as they used to. Think of the savings from longer wheel and diamond life. But, even deeper benefits result from the elimination and control of downtime for dressing wheels. Wheel change time has been reduced, too, because now Torrington can do both roughing and finishing with a fine grit wheel. Formerly, two wheels had to be used.

Solves chip removal problem

The hoe-and-wheelbarrow method of cleaning swarf from machine tools was abandoned by Torrington years ago. They float their chips and separate them in the central system. Hence, the grinding fluid must foam under proper agitation in the Hoffman flotation filter so chips can be winnowed out in a layer of rich lather. Elimination of chip carry-through is particularly important when grinding fine finishes on 52100, 8660, 4620, and E3310 Krupp, plus different grades of stainless, bronze, and aluminum. Stuart's HI-D proved to be 95% efficient in this respect. Only clean grinding fluid is returned to the machines and line obstructions due to chip precipitation have been avoided.

Reduces grinding fluid cost

Torrington reduced its coolant cost, too. Stuart's HI-D saved ⅓ the cost of the grinding fluid it replaced. The reason is, it stays on the beam at mixtures as lean as 60:1. The less expensive compounds lost their efficiency at anything greater than 40:1.

A three-month try-out on equipment like this proved Stuart's HI-D to be the best of seven grinding compounds tested at Torrington.

The cooling qualities of Stuart's HI-D at 60:1 produced another saving worth mentioning. Bryant "Centalign" grinders, which turn out small and very accurate bearings in the amazing time of 10 to 11 seconds, are hooked into the central system. With the former 16:1 coolant in the machines, the bearings came out hot. But now, with clean abrasive capable of cutting the metal instead of rubbing it, the bearings actually come out cool.

* Formerly: Dasco 102-M-18

MORE PL FACTS ▶

Productive Lubrication

new

Stuart's HI-D* checks rust, reduces costs at La Salle Steel

Stuart's new high-detergency, wide-purpose chemical compound—HI-D—proved to be just what the people at La Salle Steel Company wanted: a cutting fluid that works equally well for grinding or turning, and is capable of inhibiting rust at economically lean mixtures.

During its preliminary evaluation, Stuart's HI-D was put on two Medart turners. We're happy to report (having more than a passing interest in this product) that it made a versatile showing and was immediately put to work on 9 machines in the grinding and turning department. Jobs ranged from roughing cuts of 1/16" to 1/4" on the turners to lighter cuts for accuracy and fine finish on the grinding machines. Which brings up one of the ticklish problems at La Salle . . . in-plant protection for highly finished steel bar stock.

In testing other lubricants, La Salle found bars rusted too readily at dilutions of 30:1. But Stuart's HI-D worked efficiently at a 50:1 dilution while it held its high detergency and lubricity potency for efficient turning and grinding. La Salle maintained quality and at the same time reduced cutting fluid costs plenty (45%).

Stuart's HI-D can be used at 50:1 on machines like this centerless grinder as compared with 15:1 for the previous compound.

If you're looking for a cutting compound that combines high detergency, rust prevention, wide job range, high cooling capacity, and excellent lubricity, it will pay you to call in a Stuart representative. Our real objective is even more direct — buy a drum of Stuart's HI-D and test it on your problem jobs.

* Formerly: Dasco 102-M-18

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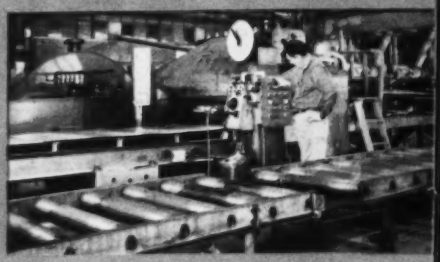


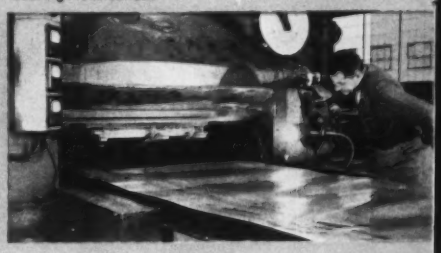
Flexible E.P. Rolling Oil boosts bearing life 50% on Sendzimir cold sheet mill

By using Stuart's Rol-Kleen 6 on their Sendzimir mill, Atlas Steels Limited, Welland, Ontario, stopped bearing failure due to lubricant breakdown — bearing life zoomed 50%.

Pumped from a 1700-gallon pit-installed tank to both bearings and work rolls, Stuart's Rol-Kleen 6 proved to be a real bear in the 21 bearings of the Sendzimir mill. Galling and spawling were eliminated. And yet it has the extra lubricity Atlas needed for rolling top-notch surface finishes on stainless and aircraft super-alloy sheets.

In the three years Atlas has used Stuart's dual-purpose Rol-Kleen 6, no bearing replacements have been traced to a lubricant failure. Reduction in maintenance has been a big factor in helping to control production at a profitable level.

Atlas turns out 2B and 2D finishes as well as light gage No. 4, using an E.P. type lubricant, Stuart's Rol-Kleen 6, for rolling as well as for bearing lubrication.



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CANADIAN D. A. STUART OIL CO., LIMITED
P. O. Box 430, 43 Upton Road, Scarborough, Ontario, Canada

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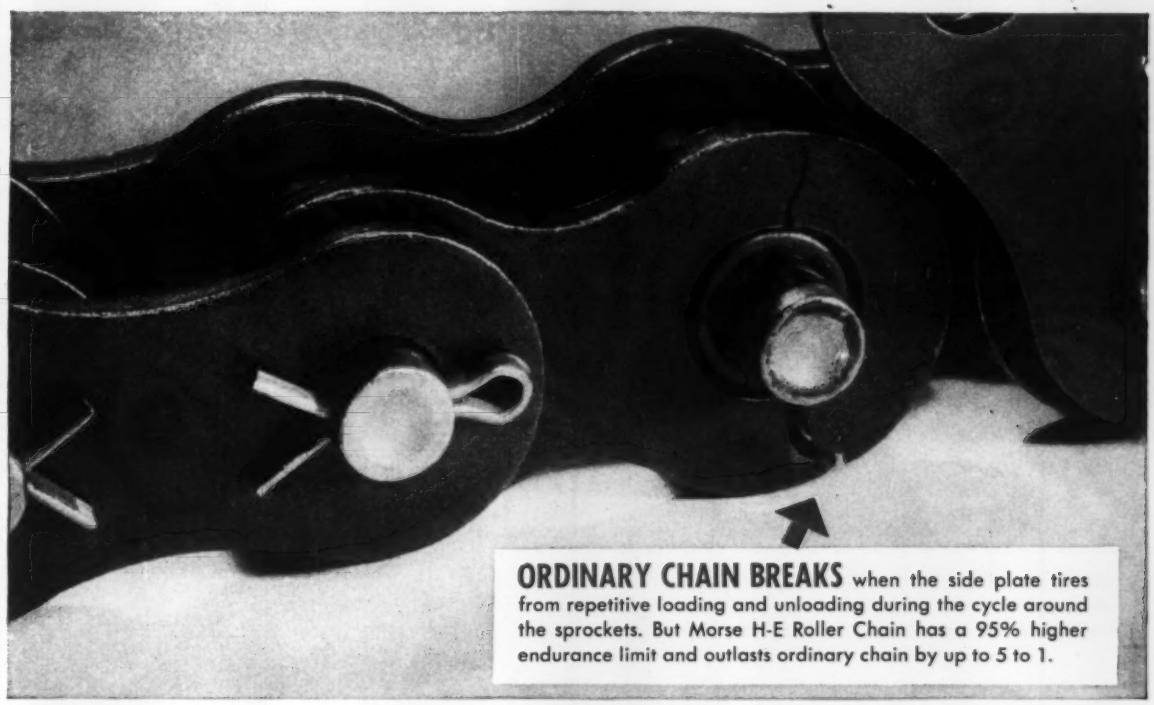


ORDINARY CHAIN BREAKS when the side plate tires from repetitive loading and unloading during the cycle around the sprockets. But Morse H-E Roller Chain has a 95% higher endurance limit and outlasts ordinary chain by up to 5 to 1.

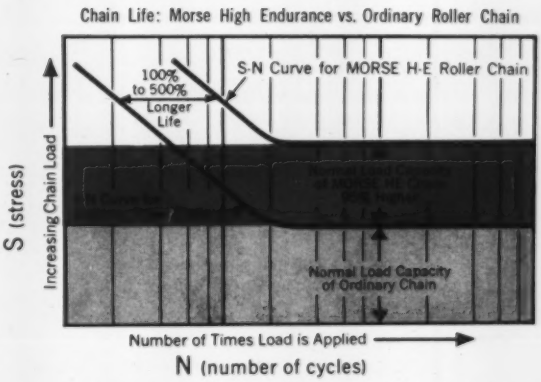
"Tired Metal"... the bane of chain now licked by MORSE H-E

Morse H-E Roller Chain has up to 500% longer service life . . . cuts replacement and labor costs

The unretouched photograph shows what happens to chain when the metal fatigues. But now a special Morse process has licked the "tired metal" problem. It gives Morse H-E Roller Chain 95% higher endurance limit . . . and up to 500% longer service life.

The special process means Morse H-E Chain costs about 10% more. But that's a small price to pay for a heavy-duty chain that can save you thousands of dollars annually in replacement costs, downtime, and wasted man-hours.

For more information on the chain that licked the "tired metal" problem once and for all, see your local Morse Distributor. Or write: MORSE CHAIN COMPANY, Dept. 2-39, Ithaca, New York. Export Sales: Borg-Warner International, Chicago 3, Illinois.


Chain Life: Morse High Endurance vs. Ordinary Roller Chain
100% to 500% Longer Life
S-N Curve for MORSE H-E Roller Chain
S (stress)
Increasing Chain Load
Normal Load Capacity of Ordinary Chain
Number of Times Load is Applied
N (number of cycles)

Red area: Under these chain loads, fatigue will break ordinary chain . . . but *not* Morse H-E.

White area: Under these loads, fatigue will break ordinary chain and Morse H-E . . . but Morse H-E will have operated 100% to 500% longer.

MORSE BW *Trademark

A BORG-WARNER INDUSTRY

REMEMBER: Only Morse offers you all four of these basic drives: Roller Chain, Silent Chain, Hy-Vo®, and "Timing"® Belts.

STEEL

CF&I - CLAYMONT

produces heads to fit your needs

The CF&I Image—a giant steelman—is a reflection of CF&I's wide range of steel products used by many industries.

The Image reflects CF&I's versatility in producing **CF&I-Claymont Heads:**

. . . in all sizes

- spun heads, precision-formed, from 9 inches up to 19 feet in diameter
- pressed heads (hot or cold formed) up to 10 feet in diameter
- in gages up to 6″

. . . in all shapes

- standard or ASME flanged and dished, conical, elliptical and hemispherical shapes, and special shapes, including: flanged and reverse dished, dished only, flared and dished, flanged and shallow dished, flanged only, as well as large segmented and welded shapes

. . . in all metals

- including: carbon, alloy, stainless and stainless-clad steels, aluminum alloys, brass, bronze, copper, Hastelloy, Inconel, Monel, and other ferrous and non-ferrous metals

. . . from large head stocks maintained at CF&I warehouses located coast-to-coast

. . . or made-to-order promptly at the Claymont plant

For complete information and order service, contact the CF&I warehouse or district sales office nearest you.

CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates • Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Clay-Loy High Strength Low Alloy Steel Plates • Flanged and Dished Heads • Manhole Fittings and Covers • Fabricated Steel Plate Products • Large Diameter API Pipe

Claymont Steel Products

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa • Oklahoma City • Phoenix • Portland (Ore.) • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita

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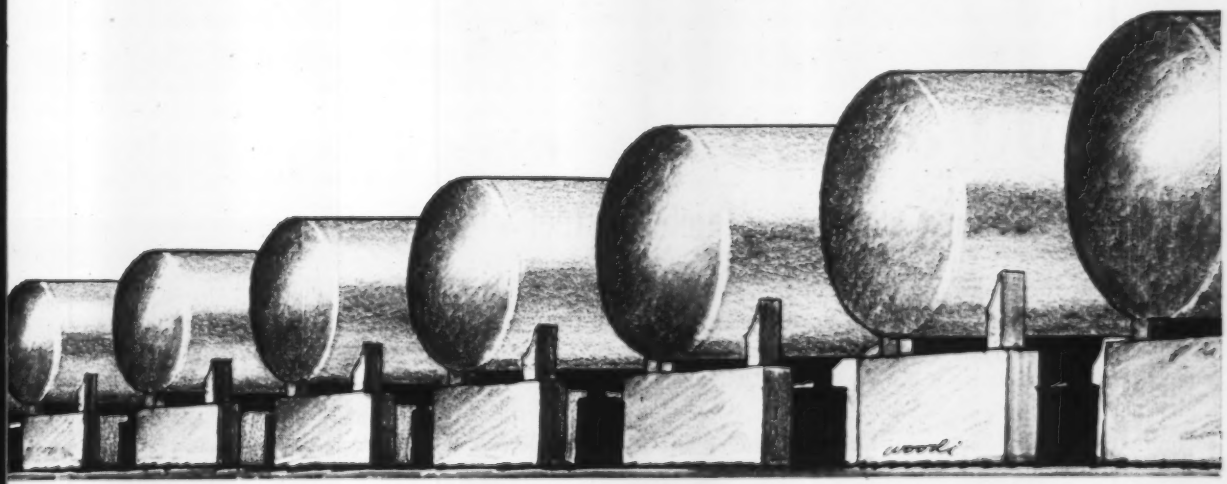
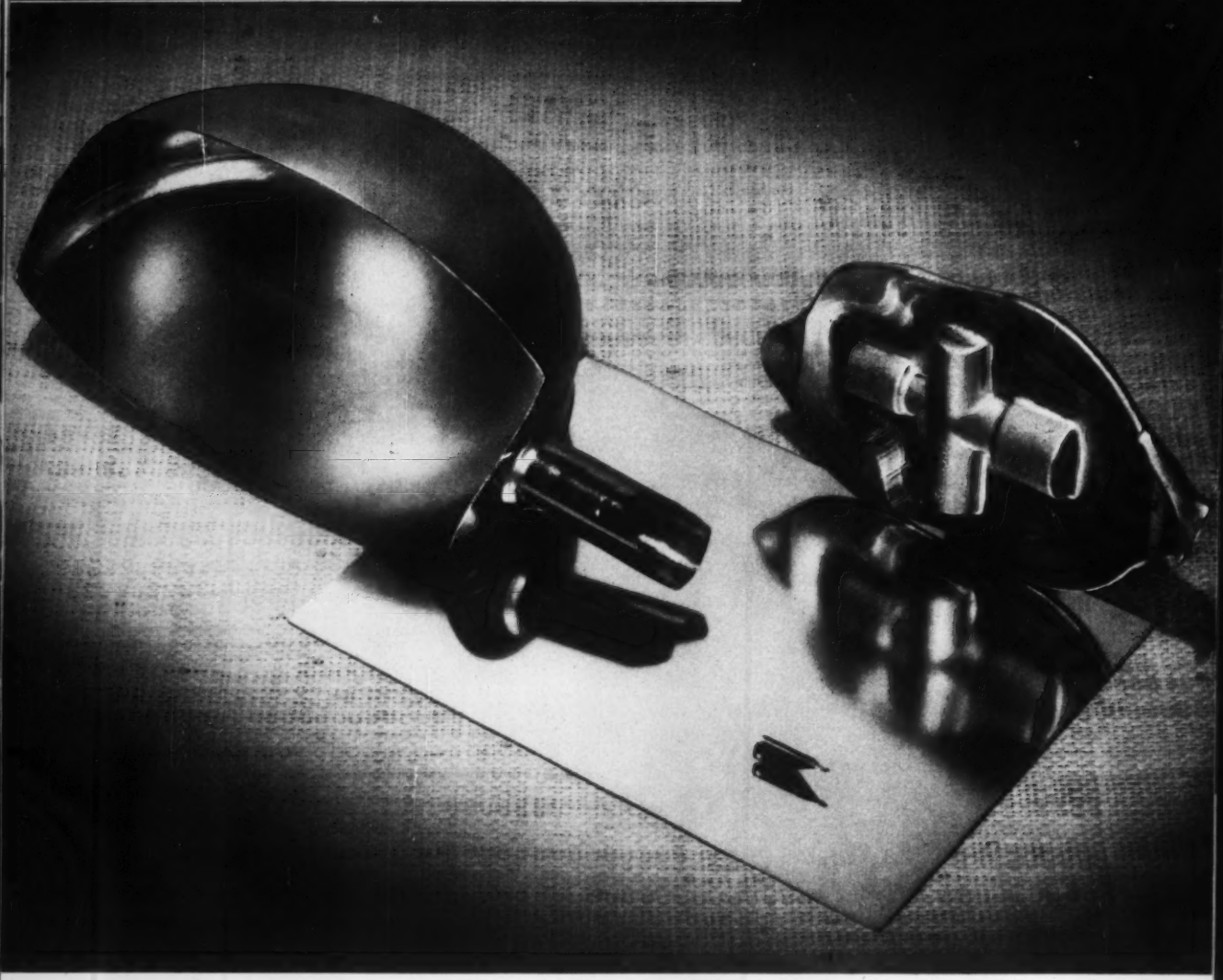


These parts were finished without buffing or polishing



Some examples of how the Diversey DS-9 Bright Dip process can solve finishing problems and lower costs. Left, cutaway of welded stainless canteen finished inside and out in a single immersion. Also shown: stainless steel pen points, stainless forgings completely de-scaled, and a stainless plate Bright-Dipped for a lustrous specular finish.

New Diversey DS-9 Bright Dip for 300 Series Stainless Steel

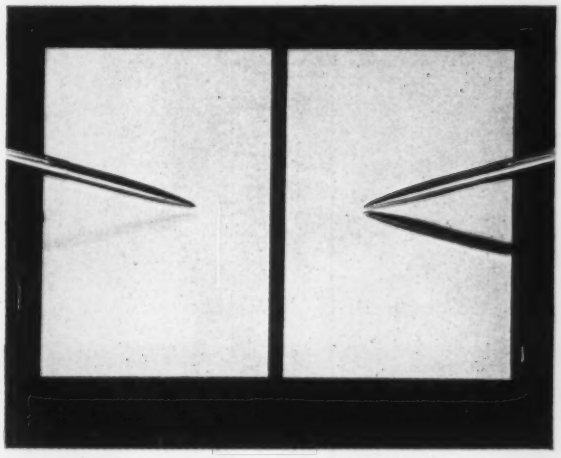
NOW—a specular finish on stainless steel without buffing or polishing!

Diversey introduces a simple immersion process that can mean lower production costs to any stainless steel fabricator. The Diversey DS-9 Bright Dip process has proved conclusively, on the production line, that it can . . .

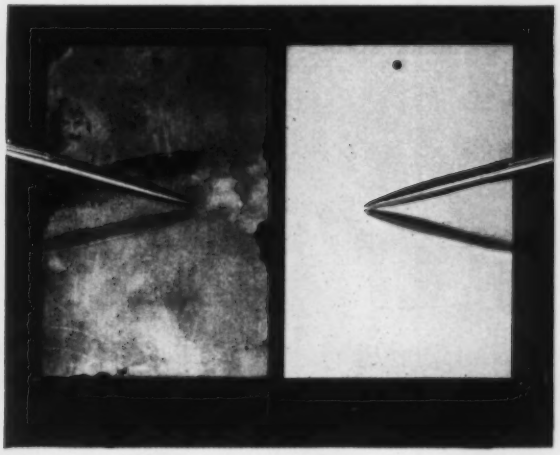
- eliminate buffing, electropolishing or grinding on many parts
- produce a bright, specular finish on stainless steel in the 300 series
- remove scale from stainless steel forgings
- remove weld scale and discoloration
- put a brilliant finish on intricate, hard-to-polish shapes in the 300 series

No electrical current used, no toxic fumes.

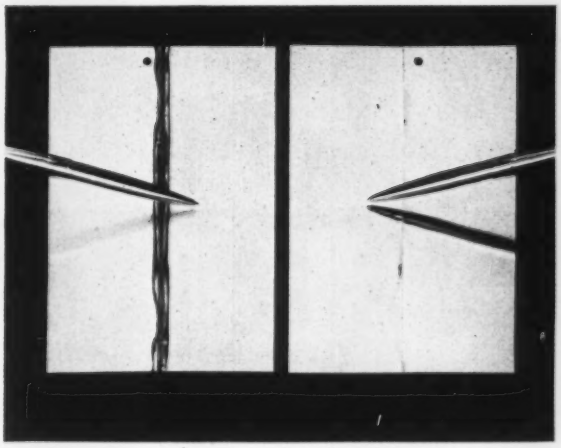
See for yourself how Diversey Bright Dip can save money on your production line



For a specular finish: *Left*, a 302-2B Mill Finish stainless sheet. *Right*, the same steel after immersion in Bright Dip.



To remove scale after heat treating. *Left*, heat treated stainless plate. *Right*, same steel after DS-9 Bright Dip process removed scale.



To remove weld scale from most stainless steel alloys. *Left*, stainless plate with weld seam. *Right*, after DS-9 Bright Dip, showing weld scale completely removed.

To remove scale from forgings of most stainless steel alloys. *Left*, stainless steel forging before and (*right*) after cleaning and finishing in DS-9 Bright Dip.

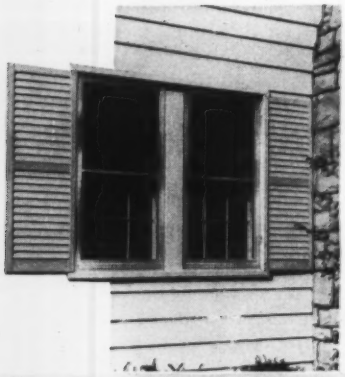
Try DS-9 Bright Dip in your plant. A trial order of Diversey DS-9 Bright Dip concentrates is available at nominal cost.

If you use stainless steel in the 300 series, it will pay you to get complete information on new Diversey DS-9 Bright Dip. *Write to Metal Industries Department, The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.*

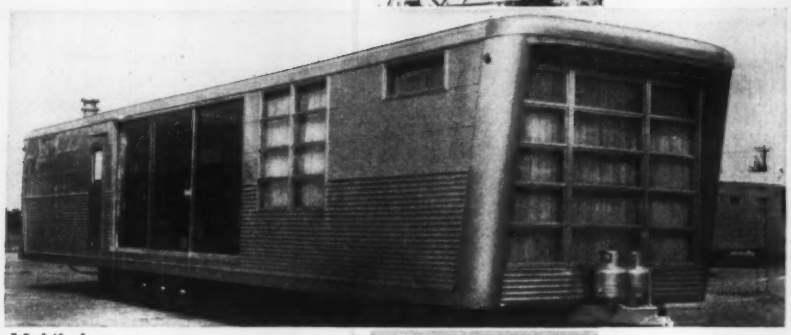
DIVERSEY.® DS-9 BRIGHT DIP ®

1820 WEST ROSCOE STREET, CHICAGO 13, ILLINOIS

When buying aluminum for your product...



Siding, shutters, window frames



Mobile homes

Typewriters

...it pays to check with ANACONDA ALUMINUM

That's because Anaconda Aluminum combines the two features labeled "most wanted" by aluminum buyers in selecting a source of supply.

First: Anaconda Aluminum craftsmen will custom-produce your order, constantly checking and double-checking it to be sure your specifications are met precisely. We produce a full range of aluminum in all forms—pig and ingot, coiled and flat sheet, rod, bar, structurals, tubular and other extruded shapes.

Second: You'll like the way Anaconda Aluminum's flexible operations will schedule your order fast, and ship it on time. This flexibility is designed into Anaconda Aluminum's new facilities for this one reason—*to give you the service you want!*

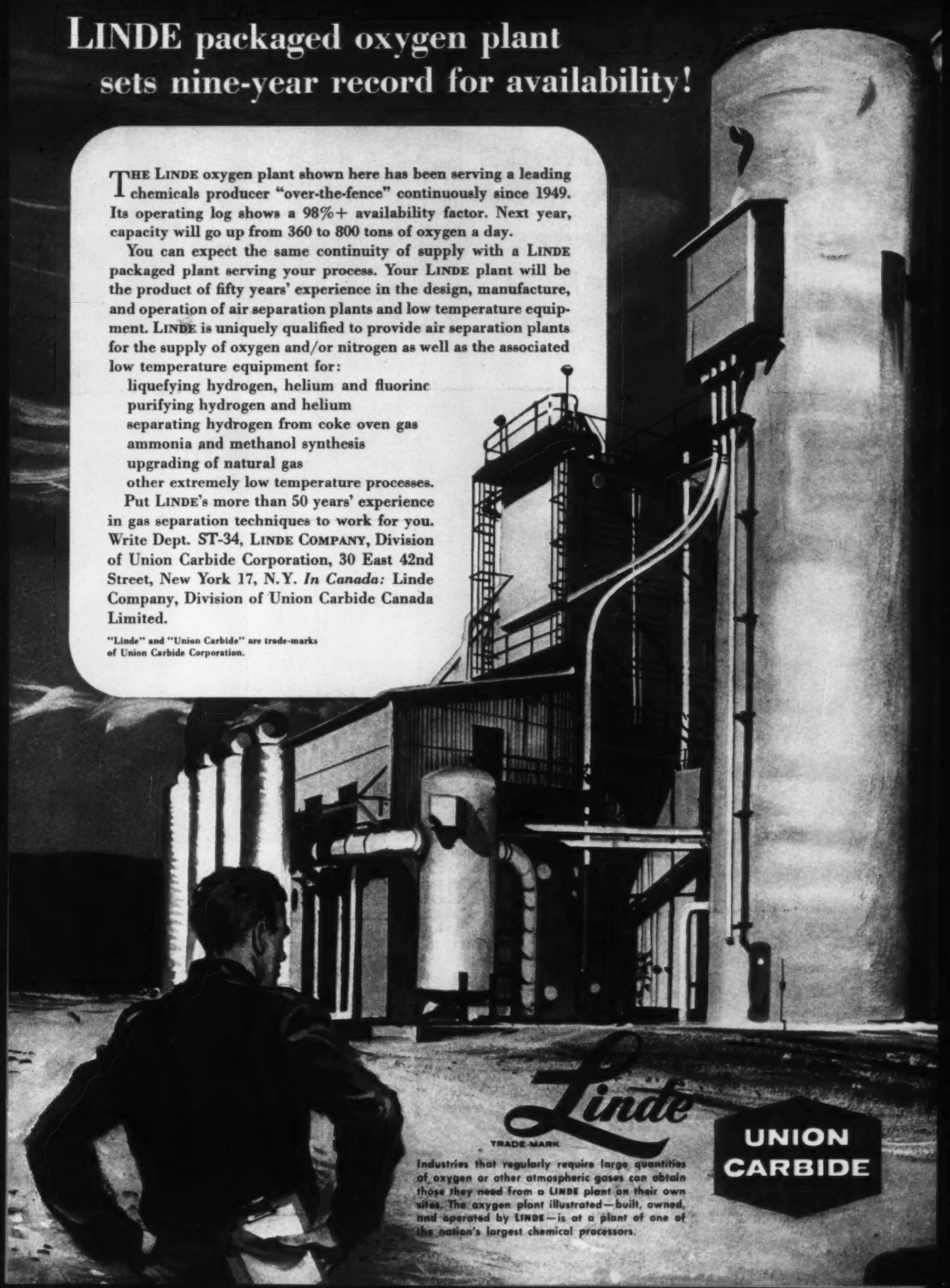
Talk over your next aluminum order with your local Anaconda Aluminum representative . . . or write our General Offices, Dept. S-3, Louisville 1, Kentucky.

Every industry has one member who specializes in customer satisfaction

ANACONDA ALUMINUM

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE, KENTUCKY

LINDE packaged oxygen plant sets nine-year record for availability!



THE LINDE oxygen plant shown here has been serving a leading chemicals producer "over-the-fence" continuously since 1949. Its operating log shows a 98%+ availability factor. Next year, capacity will go up from 360 to 800 tons of oxygen a day.

You can expect the same continuity of supply with a LINDE packaged plant serving your process. Your LINDE plant will be the product of fifty years' experience in the design, manufacture, and operation of air separation plants and low temperature equipment. LINDE is uniquely qualified to provide air separation plants for the supply of oxygen and/or nitrogen as well as the associated low temperature equipment for:

liquefying hydrogen, helium and fluorine
purifying hydrogen and helium
separating hydrogen from coke oven gas
ammonia and methanol synthesis
upgrading of natural gas
other extremely low temperature processes.

Put LINDE's more than 50 years' experience in gas separation techniques to work for you. Write Dept. ST-34, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

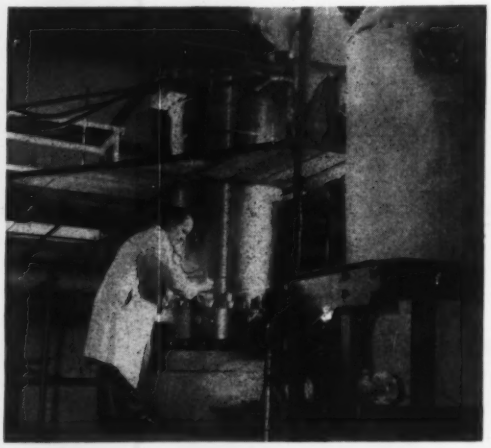
"Linde" and "Union Carbide" are trade-marks of Union Carbide Corporation.

Linde
TRADE-MARK

UNION CARBIDE

Industries that regularly require large quantities of oxygen or other atmospheric gases can obtain those they need from a LINDE plant on their own sites. The oxygen plant illustrated—built, owned, and operated by LINDE—is at a plant of one of the nation's largest chemical processors.

4-TON ESCO PUMP CASTINGS ON WORLD'S LARGEST "CANNED" PUMPS



...RESIST WATER CORROSION AT HIGH PRESSURES AND TEMPERATURES

Four mammoth Westinghouse "canned" motor pumps with *ESCO* volutes have been installed recently in the nation's first full-scale atomic electric generating plant at Shippingsport, Pennsylvania. These 1250 h.p. giants can pump 18,300 gallons of radioactive water coolant per minute at approximately 2000 psi at up to 500 degrees F.

The pump housings or "volutes" were cast by *ESCO* in Alloy 40-S (ACI-CF8), to withstand the severe corrosive effects of water at high temperatures and pressures. Castings were radiographed to ASTM specification E71, Class II and 100% dye-penetrant inspected.

Casting specifications and inspection requirements for nuclear application are thoroughly understood at *ESCO*. Equipped with the finest facilities and the technical know-how, *ESCO* welcomes the toughest casting assignments. Ask your nearest *ESCO* representative for details or write direct.

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

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MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

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JONES & LAMSON MACHINE TOOLS

the man who needs
a new machine tool is
already paying for it

The Turret Lathe with a fully automatic thread-chasing cycle!

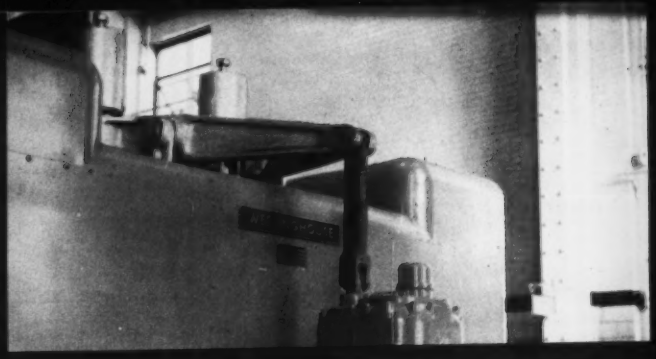
Here is full turret lathe versatility and a threading attachment with a fully automatic cycle — all in one machine. Now you can be sure of concentricity of threading with other lathe work, *all done in one chucking*, with the time saving of the Auto-Threader!

This Auto-Threader will chase straight or taper threads — or a combination — internal or external, from the front of the machine.

Other features include: uniform thread length, by means of positive stop and follower nut disengagement together with rapid tool withdrawal; precision lead control by full depth follower nut engagement on a hardened and ground leader.

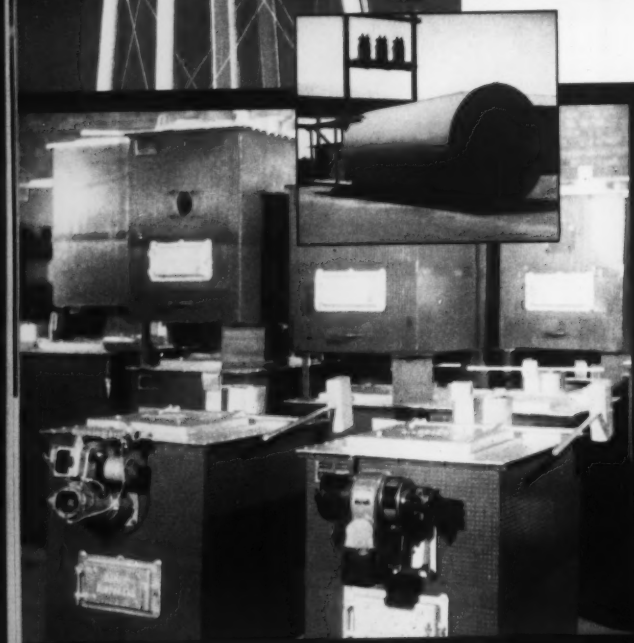
Write for descriptive folder No. 5440. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

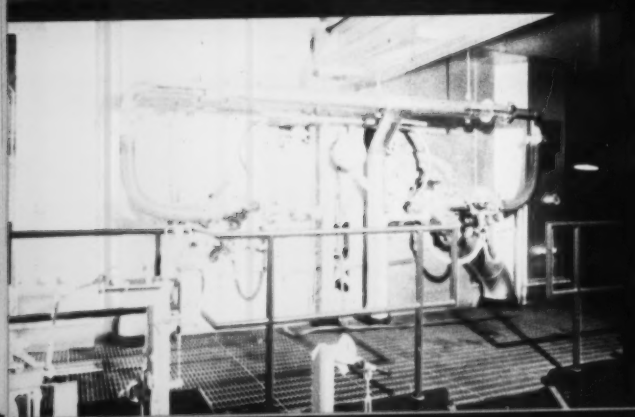
Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

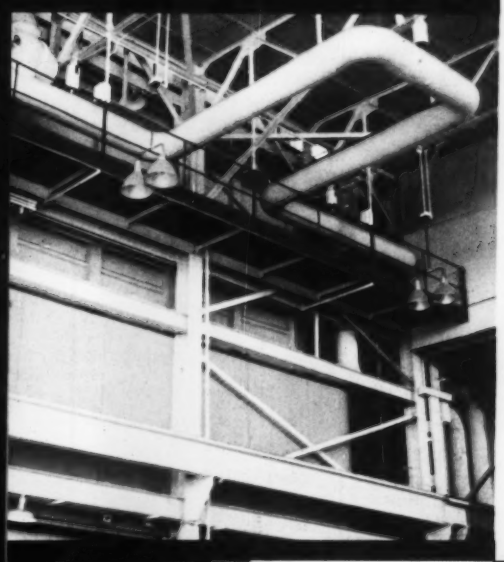


Bright, modern, functional

COLORS







...another important **Difference** in the Rust-Oleum System

How many coating manufacturers offer you a *complete system* that Stops Rust—and provides lasting beauty over the years? The Rust-Oleum *System* does just that.

First—apply Rust-Oleum 769 Damp-Proof Red Primer directly over the sound rusted surface, after scraping and wirebrushing to remove rust scale and loose rust. The *specially-processed* fish oil vehicle in the primer penetrates rust to bare metal—merging the rust into the coating—saving costly surface preparations. *Second*—the wide variety of colors in Rust-Oleum finish coatings provides lasting beauty over the primer. Your choice of practically all colors from bright enamels to soft, restful pastels—all formulated for long over-the-years protection.

What is your coating problem? From Heat Resistant, Chemical Resistant, and Machinery Finishes to Heavy-Duty Top Coatings for use indoors and out—Rust-Oleum has the coating to meet your needs and the *system* for lasting beauty. Consult your Rust-Oleum Industrial Distributor . . . he has complete stocks for your use in maintenance, new construction, and remodeling. His experience can serve you well.

A matter of excellence.
Distinctive as your own fingerprint.

RUST-OLEUM®

STOPS RUST!®

RUST-OLEUM IS AVAILABLE IN PRACTICALLY ALL COLORS

SEE OUR CATALOG IN SWEET'S

STOP RUST

with
RUST-OLEUM
769 Damp-Proof Red Primer

Eliminate costly surface preparations and save time, money, and metal. Just brush Rust-Oleum 769 Damp-Proof Red Primer right over the sound rusted surface—after scraping and wirebrushing to remove rust scale and loose rust. You can do this because the **specially processed fish oil vehicle** penetrates rust to bare metal—as proved by radioactive tracing studies.

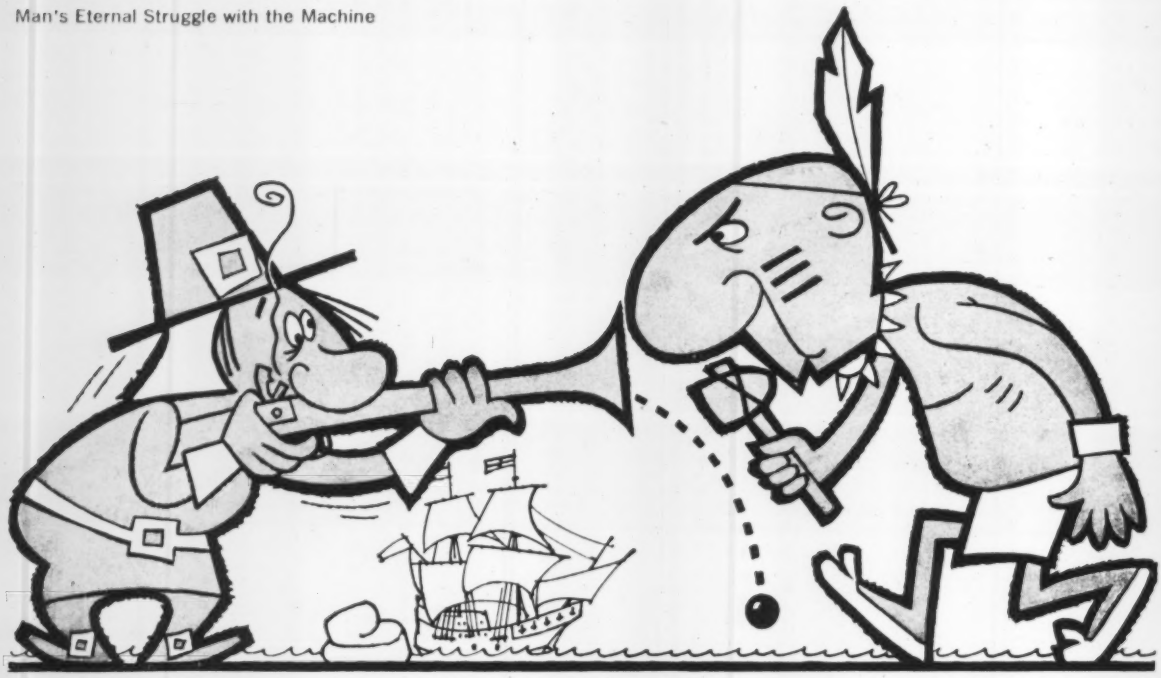
SEND FOR FREE TEST SAMPLE! ATTACH TO YOUR LETTERHEAD!

Rust-Oleum Corporation
2982 Oakton Street, Evanston, Illinois

Please send me the following at no cost or obligation:

- ☐ Free test sample of Rust-Oleum 769 Damp-Proof Red Primer for rusted metal surfaces.
- ☐ Complete literature with applications and color charts.
- ☐ Information on matching special colors.
- ☐ Thirty-page report on Rust-Oleum fish oil penetration.

Man's Eternal Struggle with the Machine



RISING COSTS AND SHRINKING PROFITS EXERT UNUSUAL PRESSURES ON PROCUREMENT

What is the risk of letting conditions tempt you to select the lowest bid?

You're in a tough spot to say the least!

Because if you care at all about *your* future or your company's profits, you take every precaution to make sure that "real deal" price tag is hanging on a machine that *will* do your job.

Obviously, price alone is indicative of nothing more than the bidder's determination of cost, plus the profit any manufacturer must earn to remain in business—nothing more—no true suggestion of value . . . and, of course, never even a hint of equipment suitability to *your* needs.

Unfortunately, the lowest bid often results from price cutting under competitive pressures. And price cutting *necessarily* down grades equipment value—unless the price-cutter is in business for reasons other than making a profit!

Sciaky resistance welding and production equipment *must* satisfy *your* manufacturing requirements. And Sciaky manufacturing operations must earn a profit just as your company must. That's why Sciaky *first* determines what *will* satisfy your requirements, and then figures the cost of putting it to work for you.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

Recently a procurement official boasted of his subterfuge to reduce costs . . . "tell every vendor his bid is way out of line, and you can brow-beat them into substantial price reductions." Besides the question of ethics, he's cheating his company of its ability to manufacture profitably, as well. Because no vendor can deliver more than he gets paid for—that is, not if he intends to stay in business. When that official's manufacturing operations begin to sag under the dead weight of phony equipment bargains, who do you suppose is going to be holding the proverbial bag?

SCIAKY®

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Ingot Mold Cars...

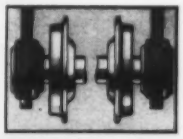
built to last by a company that uses them!

5 unique structural features make them better

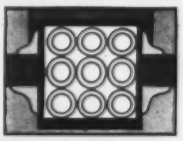
Ingot Mold Cars take more punishment than perhaps any other cars in a modern steel plant. In the 36 years we have been making these cars for our own use, United States Steel has developed a number of features in structural design that assure longer life, less maintenance, and dependable service.

Shown here is a typical 8-wheel, 200-ton capacity Ingot Mold Car. The advantages illustrated at the right—plus the rugged durability of all-welded rolled-steel construction—make any size USS Ingot Mold Car a profitable investment.

Our representative will be pleased to call at your convenience to discuss your requirements for this or any other type of industrial car. For more information, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. *USS is a registered trademark*

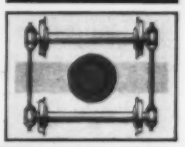


Anti-friction outboard bearings: High-capacity anti-friction bearings are located *outside* each of the car's eight wheels to minimize sideway and to provide long, smooth-running performance.



Seventy-two coil springs: Nine coil springs between each two wheels on both sides of the car—plus nine overload coils *inside* these—provide a total of 72 separate springs for a shock-absorbed *level* ride, so important in hauling molten metal.

High engineering safety factor: Designed for a 200-ton normal capacity load—including ingots, molds and stools—each car has a substantial built-in safety factor to withstand maximum ingot-stripping thrusts.



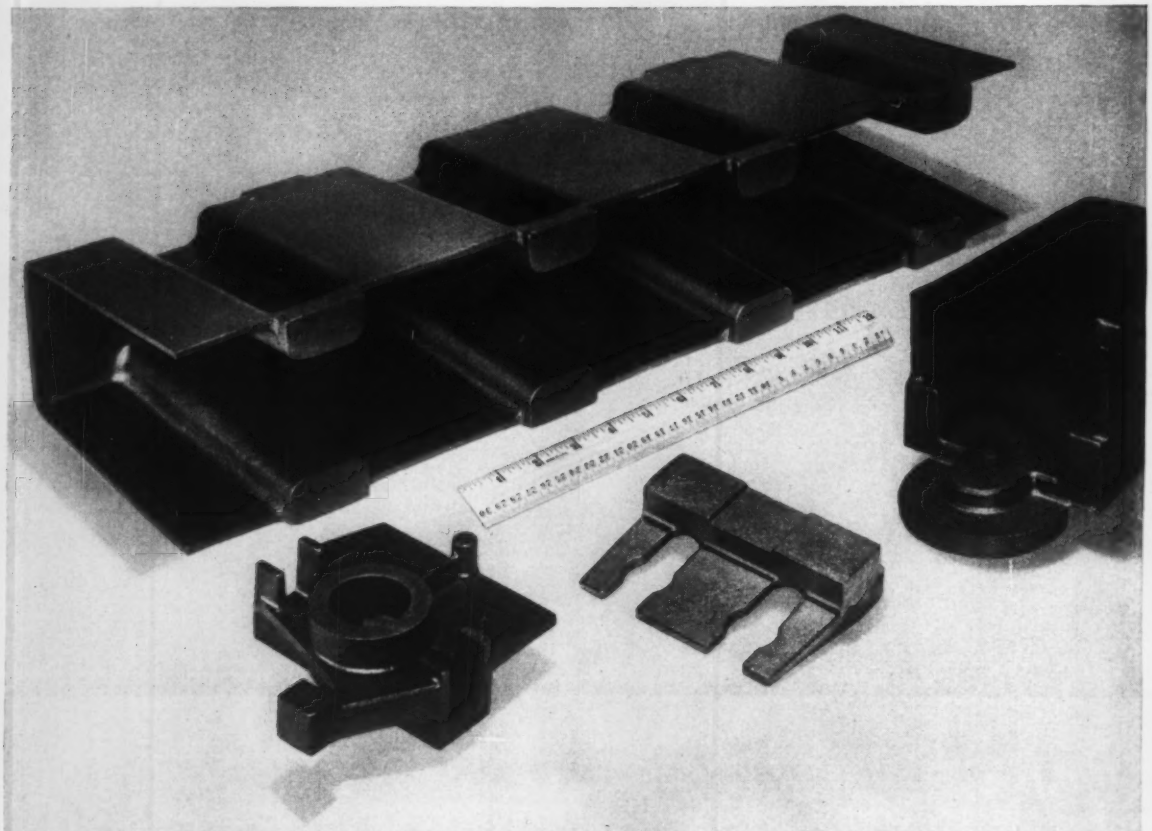
Oversize center plates: "Beefed-up" center plates between the trucks and car body are 18 inches in diameter—compared with the conventional 12 inches—to reduce the load per square inch on their surfaces.

Hot-metal shields: Curved end plates, long side skirts, and special drip shields protect the couplers, bearings and springs from runover molten metal and troublesome solidified drippings.

USS

United States Steel Corporation — Pittsburgh
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Export Company

United States Steel

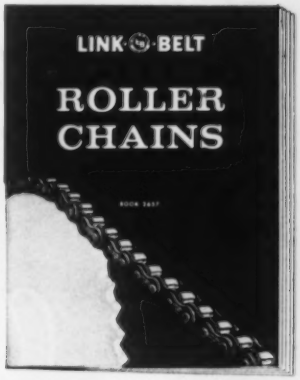


Electro-Alloys shell molded heat- and corrosion-resistant castings open a new range of applications where high dimensional accuracy, reduced machining cost, and superior finish are needed. Write

ELECTRO-ALLOYS DIVISION
1013 Taylor Street, Elyria, Ohio
for technical information.

AMERICAN Brake Shoe COMPANY

NEW roller chain engineering data book



154-pages of application information, engineering data . . . sectionalized for easiest use

Not just another catalog, but an entirely new engineering handbook — the most comprehensive, easiest-to-use yet published on design and application of modern roller chain and sprockets.

Contains full data on the complete Link-Belt line of roller chain for both power transmission and conveyors . . . helpful application facts . . . new designs. Mail the coupon below for your free copy.

LINK-BELT

ROLLER CHAIN AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

LINK-BELT COMPANY
Dept. RC, Prudential Plaza, Chicago 1, Ill.
Please send me a copy of the new Link-Belt Roller Chain Book 2657.

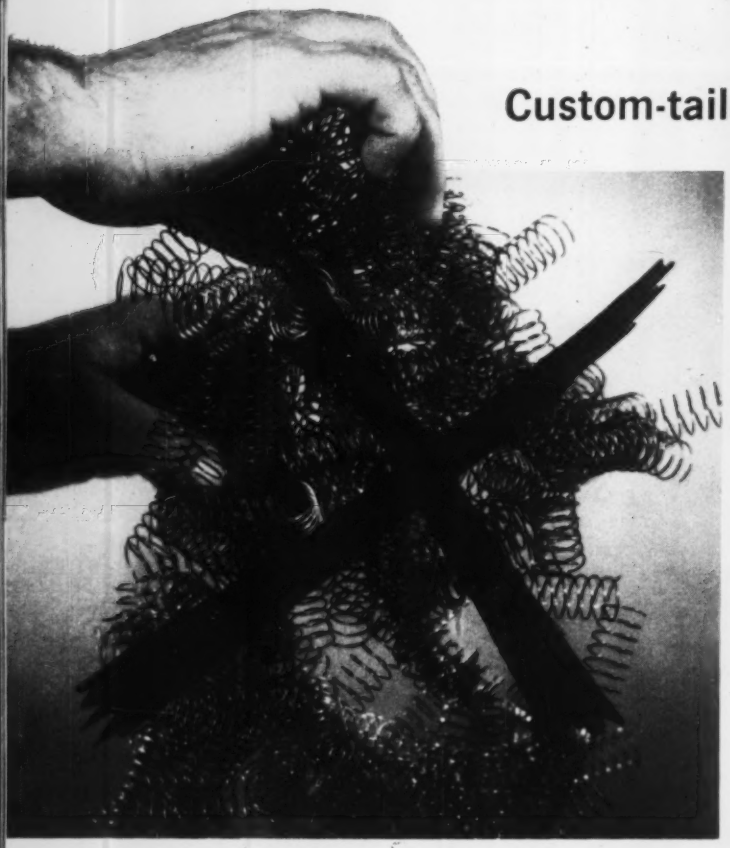
Name_____

Firm_____

Address_____

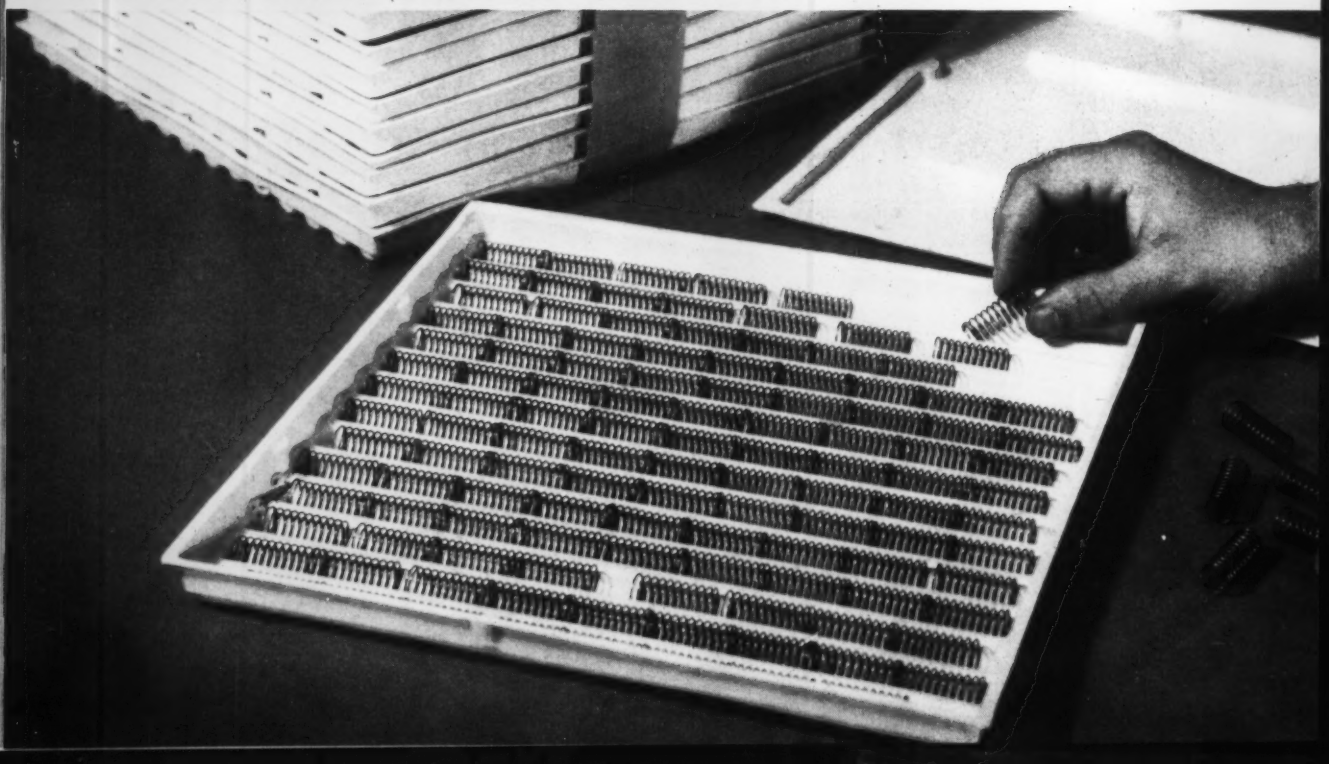
14,363

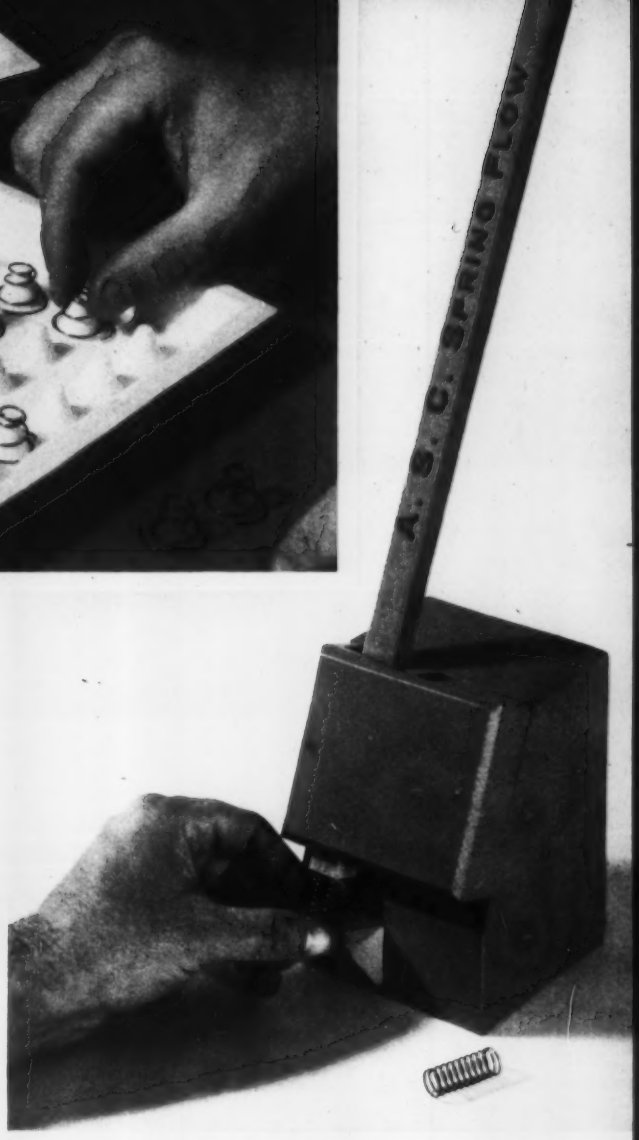
NEW... Spring Flow®



Custom-tailored packaging of springs that cuts costs and speeds operations in your plant

Spring Flow is a systematic approach to the problems of handling and storage of springs, wire forms, small stampings, in customer plants. It overcomes time-wasting tangling, and the distortion that often results from tangling. It can be engineered for specific applications to expedite hand or automatic assembly.





Spring Flow lowers handling and assembly costs—eliminates distortion—protects finish

Spring Flow makes use of a variety of modern materials, dispensers, containers. The extent to which it may be applied depends on the complexity of each individual part and handling requirements. The cost of Spring Flow is frequently offset by resulting savings.

The potential benefits of Spring Flow almost defy imagination. Ask for a Spring Flow proposal for your springs or other fabricated-metal products. Or find out more about this exclusive service by writing for the new booklet—"Spring Flow."

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
Raymond Manufacturing Division, Corry, Penna.
Ohio Division, Dayton, Ohio
F. N. Manross and Sons Division, Bristol, Conn.
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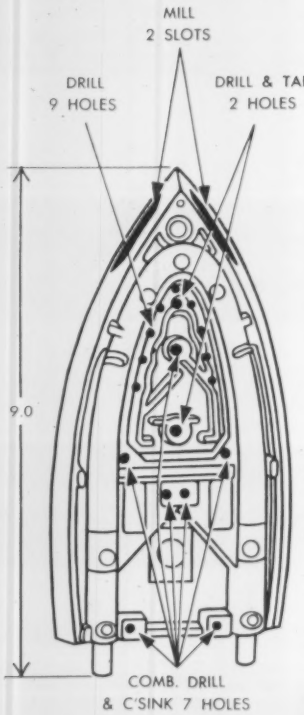
8904

22-spindle Kingsbury mills 2 slots, drills 18 holes, taps



DIE CAST ALUMINUM FLAT IRON SOLE PLATE

Five horizontal and two vertical units operate 22 tools. The vertical units mill the slots with six-inch cutters. Each cutter rotates so the thrust is down. The slots, incidentally, make it easier to iron around buttons.

Four horizontal units drill 11 holes and combination drill and countersink 7 holes. Bushings guide these tools. The last unit taps two of the holes.

A 30-inch index table holds eight work fixtures. Each has power clamping and automatic unclamping through use of an air cylinder. The point of the work is up, and clamping is outward against a fixed front plate. Gross production is 520 parts per hour.

Production men praise our machines. "Can't remember when we had trouble with them."

"Our Kingsburys do a nice job for us."

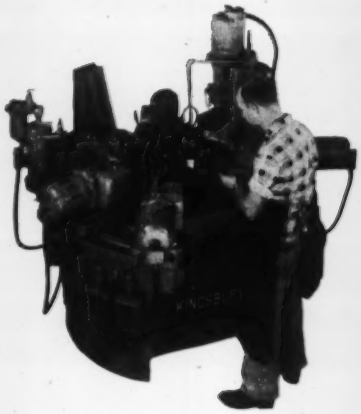
"Hardly ever get a bad part."

We think we earn those compliments. Forty years behind us and we still work hard on every machine we build. Good basic design, rugged construction, test runs before shipment — all that sort of thing really pays off.

For high production at low unit cost, ask to have a representative call and talk over your jobs. Let him get you a specific proposal. If we say we can do it, we can do it. Kingsbury Machine Tool Corp., Keene, N. H.

KINGSBURY MULTI-UNIT AUTOMATICS

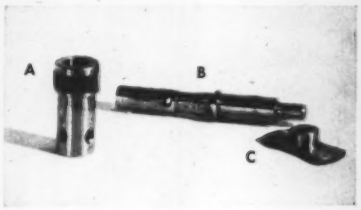
Secondary operations on screw machine parts



This 7-spindle Kingsbury operates on three parts for electric typewriters. It drills, chamfers, taps and burr reams 430 parts per hour (gross).

A 12-inch index table holds eight work fixtures with automatic clamping, unclamping and ejection. Different jaws and work locators are used for the three parts.

Part **A** uses all seven units. Six horizontal units operate on two cross holes 90° apart. A vertical unit burr reams the center hole. Parts **B** and **C** each use only three units.



Typical Kingsbury jobs in eight industries

These parts are used in a food mixer, water meter, automatic transmission, dial telephone, plumbing, air conditioner, rifle, and typewriter. All cost less on Kingsburys.

"Our new facilities for steel roll production have certainly paid off for National Roll users,"

says Bill Curran, Works Manager

"There's been a lot of comment in the industry about the big things that have been going on for the past few years at National Roll . . . expansion and new equipment that are reflected in better steel rolls for our customers.

"For example, we have in operation a new foundry, complete with modern equipment, including additional furnace facilities. This foundry is used exclusively for casting steel rolls—rolls produced by the latest methods and newest equipment to give you longer tonnage life.

"We've also added new equipment for pouring, annealing and machining rolls—both iron and steel—in a wide range of sizes.

"And while we're telling you about all the 'NEW' let us remind you that National is 'OLD' in the business of producing fine rolls. With this combination of the 'OLD' and the 'NEW,' we know we can produce rolls to your satisfaction."

GENERAL STEEL CASTINGS CORPORATION

National Roll & Foundry Division

Avonmore (Westmoreland County) Pennsylvania

General Steel Castings Corporation: General Offices, Granite City, Ill.
Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.

CARBON AND ALLOY STEEL INVENTORIES...

They can and will—if you let *Frasse* stocks be your inventory! Your cost for steel ready for use will be less. You'll save the cost of labor, handling, processing and obsolescence...free plant space and idle capital for profitable use. You incur no expense until material is needed...then only the cost of steel—*not* the purchase price PLUS the *high cost of possession.*

With Frasse stocks as your inventory, you can pick from 20 different grades—any one of 2001 sizes. For, Frasse carries a complete range of carbon bars and shafting as well as commercial and aircraft quality alloys. There's always a size and grade for any application...*immediately available.*

Weigh the advantages of this modern solution to steel inventory problems. You get broad selection, fast deliveries—and the help of specialists that offer a wealth of technical information and problem-solving techniques. Place future orders for the carbon and alloy bars you need with Frasse—*your* Steel Service Center. You'll find it convenient...and far more economical than maintaining your own inventory.

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COMPLETE CARBON AND ALLOY STEEL SERVICE

Frasse Carbon and Alloy Stocks Include:

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C1045	C1212	E4130
B1112	C1213	4140
B1113	Ledloy	4142
B1113X	4615	E4340
C1117	8620	E8740

4140 H.T. • 4142 H.T.

Precision Shafting • Special Finish
Turned & Polished Shafting • Drill Rod
4130 Aircraft Quality Sheets

AMERICAN STEEL WAREHOUSE ASS'N
YOUR STEEL SERVICE CENTER

Peter A. Frasse & Co., Inc.

New York 13, N.Y.	Philadelphia 29, Pa.	Buffalo 7, N.Y.	Syracuse 1, N.Y.	Hartford 1, Conn.
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46 x 90 inch Universal Slabbing Mill at the Fontana Works of Kaiser Steel Corporation.

BLAW-KNOX

UNIVERSAL SLABBING MILLS

Blaw-Knox designs and builds slabbing-blooming mills in a complete range of sizes in universal and high lift types. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Blaw-Knox Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or composite design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Tuffy Tips —on safe use of Slings and Hoist Lines

Professional Weight Lifters Work the Safety Angles

Here's a tip that could save an injury and absenteeism. The weight lifter's secret is proper leverage. Plus use of major leg muscles instead of back muscles. The weight lifter never leans over to pick up the load. He squats down as near as possible to it, and keeps his back erect all the time. Lifting action comes from legs and thighs. If you must use muscle for some of the lighter lifting jobs, these points are worth remembering. But wherever possible—and always for heavy loads—use hoists and slings.

How to Play It Safe When Loading Slings and Hoist Lines

1. **Keep pull** on sling legs in a straight line. Never shorten legs with knots or I-bolts. If choker and basket hitches are used on slings, check rated load limits.

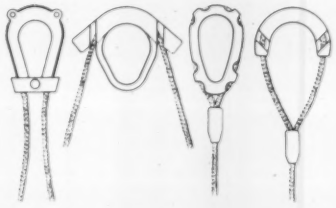
2. **Load slings** on the center of hooks. Never at their points, except for hooks specially designed for point loading.

3. **Never use** load hooks that are bent open. They have been overloaded, and may drop loads with disastrous results. Same goes for defective chain blocks. Insist that your men report them at once.

4. **Lubricate wire ropes** at regular recommended intervals, with lubricant recommended by your local oil company engineer.

Proper Fittings Can Give Slings Added Safety and Service Life

The sling eye is usually the point of greatest wear in load handling. The proper sling fitting acts as a shield to take the brunt of this wear—the load shocks, abrasion and other stresses concentrated in the eye. Shown here are some of the Tuffy fittings you can have factory-installed in your Tuffy Slings, or they can be installed in your own rigging loft. Left to right: (1) **Equalizing Thimble** permits adjustment of the length of sling legs so that loads of varying dimensions may be picked up and handled on an even keel. (2) **Newco Sling Bridle** will not slip when handling unbalanced loads. (3) **Newco Slip-Thru Thimble** allows passage of an identical thimble through its eye—necessary when a regular sling is used as a choker sling. (4) **Newco Slip-On Thimble** eliminates flattening or pulling together of eyes under heavy loads; can be attached or removed in seconds.



Tuffy Sling Stamina is Matched in Tuffy Hoist Line

Tuffy Hoist Line is a special rope construction for use on all types of overhead cranes, derricks and clamshells. Like all Tuffy Special Purpose Ropes, it has the right combination of strength, flexibility and toughness for greatest safety and longest life in its specific range of uses. Tuffy Slings and Hoist Line make a team that cuts hoisting costs and downtime in every type of materials handling.

Your Tuffy Distributor Offers the Most in Service and Savings

Tuffy Braided Wire Fabric: Successor to Wire Rope in Slings

The unique machine-braided construction of Tuffy Slings provides a combination of "free flowing" flexibility and toughness never possible with ordinary wire rope. The difference is in the patented 9-part fabric, braided by precision machines in a process that eliminates inequalities of hand-braiding.

Kinks Are No Hazard with Tuffy Slings

One of the first rules of safety: never use a wire rope sling that has been kinked. The wires are permanently bent, damaged or weakened. Not so with Tuffy Slings. Tuffy's patented, 9-part machine braided fabric is just about impossible to kink. And if it does, under some unusual condition, you can straighten out the kink, leaving no material damage.

Tucked Eye Splices— Gripped in Steel for Strength and Safety

This Tuffy ferrule, slipped over the tuck-splice of the eye and pressed on under tremendous hydraulic pressure, holds so tight that it gives the eye splice 100% of fabric strength. The ferrule itself is smoothly tapered to meet the main body of the sling. No abrupt edges or rough projections to injure hands and slow down work. The extra life, efficiency and safety of Tuffy's pressed-on ferrule is yours at no extra cost!

FREE! New Tuffy Sling Handbook

Revised and enlarged edition of this famous sling manual. Covers slings from A to Z. Types, dimensions, weights, rated loads, fittings. Even includes safety-approved standard signals used in operation of various equipment. Send for your free copy now. Union Wire Rope Corporation. Specialists in high carbon wire, wire rope, braided wire fabric and stress relieved wire and strand. 2160 Manchester Ave., Kansas City 26, Mo.

S 2

UNION Wire Rope

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Plan Your Steel Insurance Now

With steel supply tightening up again and the possibility of a real scarcity in the months to come, it's nice to have your orders for plain and fabricated steel in the hands of a reliable and well-supplied organization.

Steel buyers everywhere know Levinson's reputation for having steel on hand . . . and for "fabrication that fits."

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Warehousers, fabricators, designers of steel for over half a century

the **LEVINSON STEEL COMPANY**

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FORGED Parts Cut Rejects

...save machining time

"The word *forged* on any part often indicates better quality and value, at an advantageous price. Take our products as examples: we shape parts by cutting or grinding, often using highly automatic equipment; if machining uncovers a hidden flaw, that part is a reject, *a loss;* if a part should have an undiscovered hidden flaw, it might fail. So we use forged parts for important components, *because forged parts almost never have hidden flaws.* Forged parts reduce our rejects, cut our costs, give our customers better quality, better value."

JAMES A. REYNOLDS, *General Purchasing Agent,*
Manning, Maxwell, & Moore Inc.
Manufacturers of valves, gauges, industrial instruments, electronic process control systems, cranes, and hoists.

POSTSCRIPT: THE PRODUCTS OF THE FORGING INDUSTRY ARE FOUND AT VITAL POINTS OF MODERN CONVEYANCES AND MACHINES... LEVERS, STRUTS, CRANKSHAFTS, GEARS. THE FORGING PROCESS IS UNLIKE ANY OTHER. *FORGED* PARTS START WITH REFINED METALS – METALS ALREADY TRIED AND PROVED. THESE METALS ARE GIVEN ALMOST ANY DESIRED SHAPE BETWEEN IMPRESSION DIES, UNDER ENORMOUS PRESSURE OR BY CONSECUTIVE BLOWS FROM POWERFUL HAMMERS. THE PROCESS IMPARTS ADDED STRENGTH AND TOUGHNESS... WHICH PERMITS WEIGHT-SAVING DESIGNS, CUTS SERVICE COSTS, HELPS PROVIDE SAFETY IN A HIGH-SPEED WORLD.

DROP FORGING ASSOCIATION

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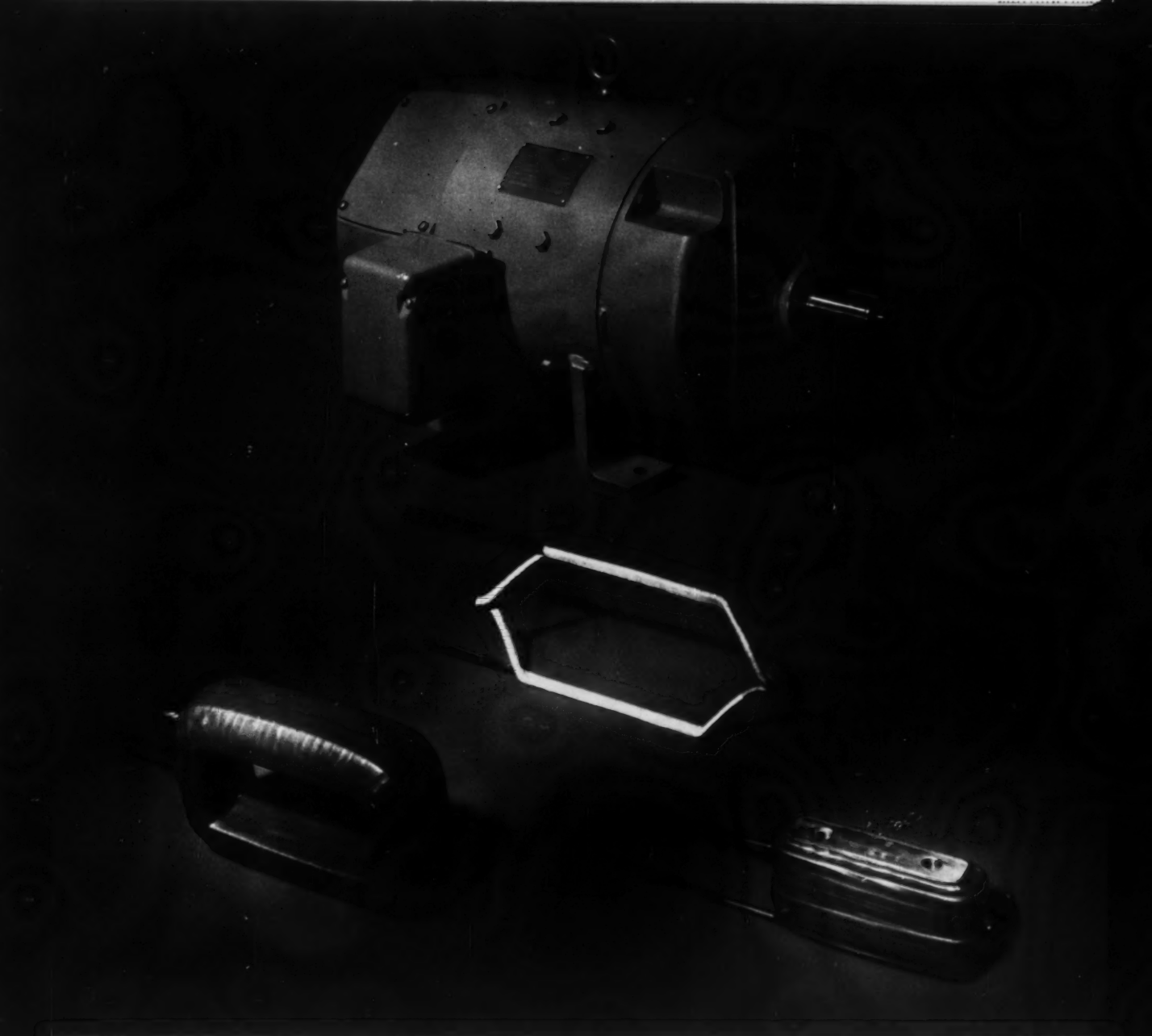
COMPOSED OF 100 COMPANIES PRODUCING THE MAJOR SHARE OF COMMERCIAL FORGINGS IN THE UNITED STATES & CANADA



NEW GENERAL ELECTRIC DC MOTOR HAS

Coils Encapsulated for Longer Life

KINAMATIC* . . . *a new standard in industrial direct-current motors* . . . designed to give extra dependability to automated production systems.

Encapsulated Field Coils . . . insulated with mica and glass and permanently sealed against moisture and corrosive airborne materials . . . virtually eliminates insulation as an element in motor life and adds a reliability factor never before available in a standard direct-current motor.

Greater Versatility . . . a 15% service factor now available in the standard, dripproof d-c Kinamatic motor means user can: 1) obtain 15% more than rated power for normal life of motor; 2) obtain 100% longer motor life at rated power; or, 3) obtain greater versatility on speed and horsepower duty cycles.

Additional information is available at your nearest General Electric Apparatus Sales Office. Or, write for Bulletin GEA-6355. *Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.*

*Trade-Mark of General Electric Company. 813-12

Progress Is Our Most Important Product

GENERAL ELECTRIC

Sheet and strip—more than 20 kinds—and Ryerson delivers fast!

You name it—Ryerson has it.

Hot and cold rolled sheets. Pickled and oiled sheets. Tight-coated galvanized and galvannealed sheets that won't flake or peel when you form them. Stainless sheets. Ryex expanded metal. Perforated sheets. And many others, all in a wide range of gauges and pattern sizes.

Need special sizes? Modern equipment cuts them to your specifications quickly and economically, in blanks, straight lengths or coils.

Ryerson also offers a complete line of metalworking machinery and tools to meet virtually every requirement.

When you want sheet and strip, give Ryerson a call—it pays!

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Ask about this Ryerson Plan for 1959

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RYERSON STEEL®
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Principal Products: Carbon, alloy and stainless steel — bars, structurals, plates, sheets, tubing — aluminum, industrial plastics, metalworking machinery, etc.

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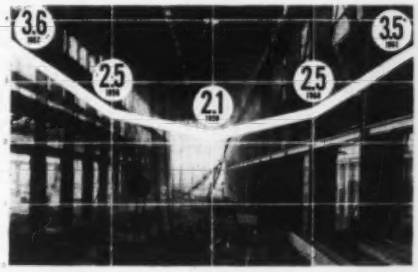
Builders Forecast Construction Upturn



One of the best barometers of industry health is due for a rise this year. Volume of new industrial work put in place will lag behind 1958, but new starts should forecast a real upturn next year. Industrial building completions this year: $2.1 billion worth (Page 67), with a strong second half.

Informal U. S. Talks with Steel Begin

Because the steel industry is "more cohesive" than the auto industry, a spokesman for the Federal Mediation & Conciliation Service notes a lack of pressure on the service to start formal discussions with the industry and the union this soon before the May-June negotiations. But this source reports the service has "good contacts" on both sides, and that Pittsburgh and Chicago steelmen have participated in informal discussions in the last two weeks. The service has had no indication of interest from the White House (see Page 76).

Depreciation Policies Lead to Paper Profits

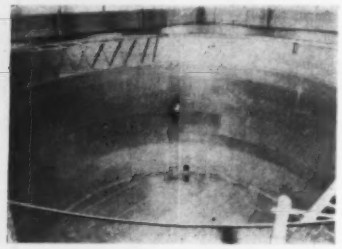
Over the last quarter century, American businessmen have overstated their profits by more than $100 billion, charges George Terborgh, research director for Machinery & Allied Products Institute, Washington. That's the result of our faulty depreciation policies. Until they are reformed (Page 72) that paper profit total will build up at the rate of $6 billion to $8 billion annually—a sum on which we are paying taxes and dividends.

Opposition Stalls Kennedy Labor Bill

Another independent labor reform bill has been tossed into the Congressional hopper, this one by Sen. John L. McClellan (D., Ark.). A stalemate may be the net result of all the bill writing, with no labor measure going to a vote this session. The rush behind the Kennedy-Ervin Bill has been dampened by powerful Senate opposition; favoring a tougher measure are Sen. Carl Curtis (R., Neb.) and Sen. Karl Mundt (R., S. Dak.). Labor will oppose the McClellan Bill because of stiff sanctions against unions which don't

conform to reform standards; they could lose recognition by the NLRB and their tax exempt status.

Producing for Submarine Warfare



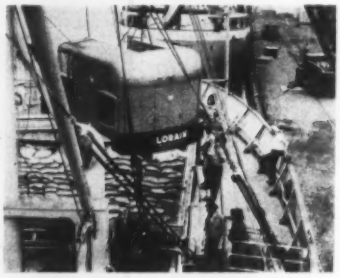
Your production for national defense may be headed for the depths of the sea, rather than outer space. Anti-submarine warfare is assuming major priority in military planning in answer to the massive Soviet submarine threat. Metalworkers will have to supply the Navy's hardware needs as well as equipping federal projects in undersea exploration. Government spending for oceanographic research facilities may hit $459 million in the next ten years (Page 74).

Bigger Defense Outlays Seem Certain

A new look into expansion of our missile programs may stem from President Eisenhower's national defense address last week. Sen. Styles Bridges (R., N. H.), a conservative and ranking member of the Senate Armed Services Committee, wants a stepped-up Polaris program, railroad launchers for the Minuteman, and hard bases for the Atlas and Titan. The Navy is thumping for 12 Polaris subs a year, rather than the three a year allotted by the administration.

St. Lawrence Seaway Tolls Decided

Industry can start planning its use of the St. Lawrence Seaway now that tolls have been set by U. S. and Canadian governments. They match last year's proposal by the St. Lawrence Seaway Development Corp. to pay off our cost of $130 million in 50 years. One traffic manager tells STEEL he can save $20 a ton shipping on the waterway. (Page 79).



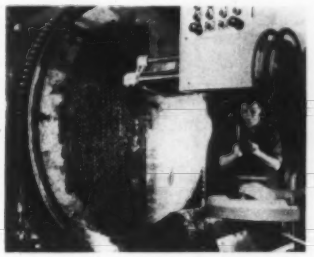
Congress To Study Small Business Administration

Look for a Congressional investigation into the effectiveness of the Small Business Administration. "We have had called to our attention considerable criticism of delay, red tape, and the lack of effectiveness of both the loan and financing programs," says Subcommittee Chairman Rep. Joe Evins (D., Tenn.). Another subcommittee will check small business' declining role in defense contracts. Prime awards to small business in fiscal 1958 were 17 per cent of the $22 billion contracted by the Pentagon; this share dropped to 15 per cent in the first six months of fiscal 1959.

Results of Atomic Market Survey

Here are preliminary results of a market survey for atomic energy products. (Sponsors: The AEC and the Commerce Department's Census Bureau.) Shipments of radiation detection and monitoring devices came to $16 million in 1957; reactor vessels and tanks, $10 million; accessory instrumentation for reactor control, $9.5 million; fuel elements, $8.6 million; valves, $7.8 million; pumps, $6.1 million; heat exchangers, $8.3 million; control and measuring devices containing isotopes, $6 million.

Tape Guided Drills Cut Parts Cost



Tape guided target drilling has taken a 35 per cent slice out of one producer's drilling costs. This trimming of costs is done with horizontal drilling and boring machines built by an Ohio toolmaker. The machines take their orders from standard perforated tape. With variable speeds and feeds on one operation, drilling is simpler on clad steel (Page 128).

Commerce Turns Down Sale to Soviets

Secretary of Commerce Lewis L. Strauss has denied for the third time in one year an American firm's application for a license to export large diameter line pipe to Russia. The applicant seeks to sell the Russians 12,227 short tons of 28 and 30 in. welded carbon steel line pipe, valued at about $2.5 million. The denial was made on the grounds that approval would be contrary to our national interest. Under law, the Commerce Department cannot reveal the identity of export license applicants.

How About Explosive Cutting?

If explosive forming of metals isn't down your alley, a new technique devised by E. I. du Pont de Nemours & Co. Inc. may be the answer to some of your tough cutting jobs. Du Pont developed a special, easy-to-handle explosive which greatly simplifies the application of blast to metals. Whether you're cutting straight lines or punching holes in material, this explosive can do the job quickly, safely (Page 104).

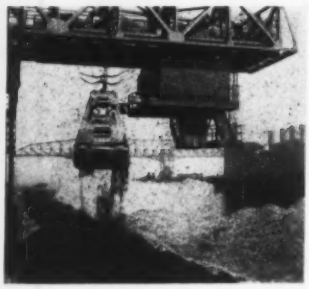
Ship Repair Lowest Since War

The ship repair industry is in its worst slump since pre-World War II days. Industry leaders place the blame on a world-wide recession in shipping. Hardest hit at the Port of New York are the Bethlehem Steel shipyards and

Todd Shipyards Corp. Smaller volume shore shops are hurting a little less. At yearend, reports the Shipbuilders Council of America, 90 shipyards employed 25,239, compared with 91 yards employing 37,627 in 1957.

Weather Will Delay Lake Ore Shipping

The worst ice conditions in years will delay Great Lakes port openings at least seven to ten days, says the weatherman. Ore carriers had hoped to start the shipping season on Apr. 1 since increased mill activity and stockpiling against a steel strike has boosted ore demand. An expected 70 million to 75 million tons of ore will be shipped this year, vs. 53 million tons moved in 1958 (Page 151).



Pentagon Ponders: Drop or Keep Titan Missile?

Raging in the Pentagon again is the argument about whether to drop Martin Co.'s Titan intercontinental ballistic missile. There's no question about its being potentially a good weapon. It's about 15 months behind the development of the Atlas by General Dynamics Corp.'s Convair Div. The question is whether it will be enough better than the older Atlas to merit more time and money. Watch for a decision soon.

Oil Reserves at All-Time Highs

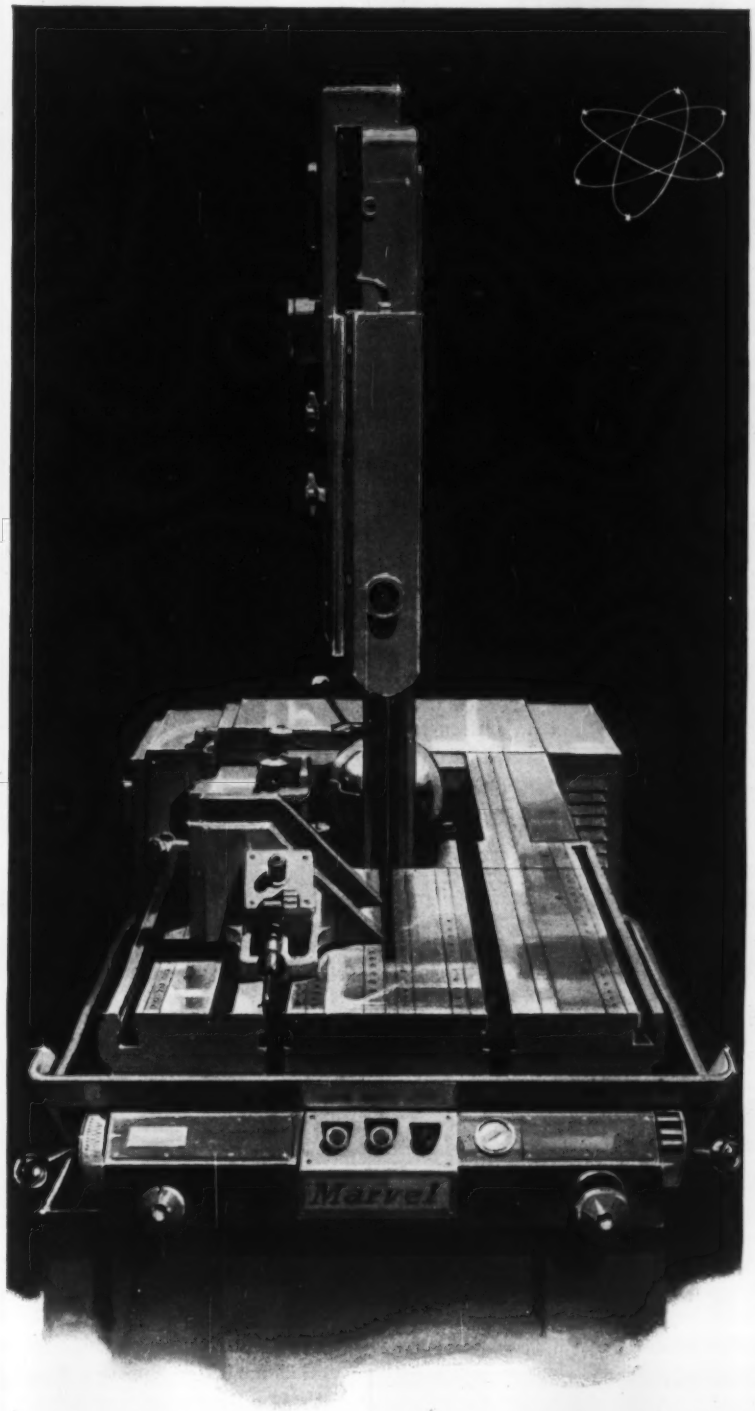
Despite a slow drilling season in early 1958, the U. S. oil industry managed to end the year with record highs in proved reserves of crude oil, natural gas, and natural gas liquids. The American Petroleum Institute reports that yearend reserves levels surprised many oil men because there was a decline in 1957. Reserves now stand at 30.5 billion barrels of crude oil; 6 billion barrels of natural gas liquids; 254 trillion cu ft of natural gas.

Dial 507: It Keeps Employees Informed

At U. S. Steel's Columbia-Geneva Works, an employee can dial 507 and get the straight scoop on the latest rumor—right from the mouth of the plant superintendent (via recordings). The new telephone answering system also keeps employees informed on operating statistics, industry developments.

Straws in the Wind

Administrators of employee benefit plans must file full descriptions of their programs with the secretary of labor no later than Apr. 1 . . . The Post Office Department has asked the Defense Department if it can borrow a few Regulus or Snark missiles for experiments in mail delivery . . . U. S. exports dropped to $16.3 billion in 1958, compared with $19.5 billion in 1957. The value of imports was down 1 per cent to $12.8 billion, but volume set a record.



A goal we set many years ago has been reached.

When MARVEL decided to produce a heavy duty production band sawing machine, we were determined to bring out the most advanced, the most efficient band saw that it would be possible to produce . . . regardless of the cost in research, invention, and truly "new" design.

We were not interested in producing a band saw that would be only "as good" or "equal", or even "similar" to other machines already on the market. The new MARVEL Band Saw would have to be a superior machine—years ahead in design and performance . . . and its design must solve problems that have constantly challenged band saw builders and users alike:

Improve Band Sawing Accuracy . . . Extend Band Blade Life . . . and Reduce Cost Per Cut to the Minimum.

The recent introduction of the MARVEL No. 81 Series Heavy Duty Universal Hydraulic Band Saw Machines, specifically designed for use with high speed steel band blades, and equipped with a MARVEL invention—the "Sure-Line" Automatic Blade Control*—is *THE* major technical development in metal band sawing during the 20th Century.

The MARVEL "Sure-Line" Automatic Blade Control is an electro-mechanical servo-mechanism that continuously senses and automatically corrects any tendency of a band blade to cut inaccurately. The "Sure-Line" unit literally "steers" the blade to make it cut in a straight line.

Because of this exclusive feature, MARVEL No. 81 Single Cut, and No. 81A Automatic Bar Feed Band saws are the only modern band sawing machines capable of fully utilizing all the advantages of high speed steel band blades. Heavier feed pressures and higher blade speeds can be safely applied with complete assurance that the accuracy of cut will not be impaired. This leads to much faster production.

For this—and many other reasons, the new MARVEL No. 81 Series Band Sawing Machines are literally *Tomorrow's Saws Today!* Why not write for full details now?

*BASIC PATENT APPLIED FOR

FROM MARVEL...

TOMORROW'S SAW TODAY!

ARMSTRONG-BLUM MFG. CO. • 5700 W. BLOOMINGDALE AVE. • CHICAGO 39, ILL.

MARVEL Metal Cutting SAWS — Better Machines—Better Blades

NOW Ni-Resist ductile irons offer you new combinations of useful engineering properties

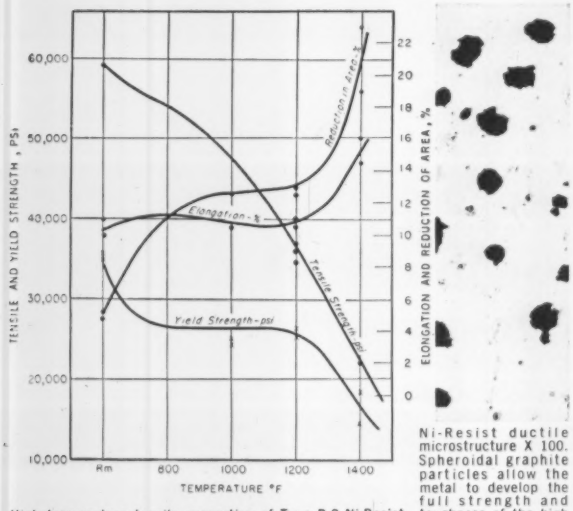
Ni-Resist* ductile irons are a new family of versatile high-alloy cast irons developed by Inco. Containing 18 to 36% Nickel, they provide the same high order of corrosion and heat resistance given by Ni-Resist flake graphite iron...plus high levels of strength and ductility.

There are several types of Ni-Resist ductile iron. Each one combines a useful array of engineering properties.

Strength Ni-Resist ductile irons provide tensile strengths of 55,000 to 80,000 psi, yield strengths of 30,000 to 44,000 psi. See graph of properties below.

Toughness Ni-Resist ductile irons give elongations of 4 to 40%, together with good impact resistance. The photomicrograph below shows why – spheroidal graphite particles allow formation of an austenitic matrix. This nickel alloy matrix develops full ductility and strength . . . keeps these properties at low temperatures.

Corrosion resistance Ni-Resist ductile irons safely handle hundreds of corrosives. Under most conditions – with acids, alkalies and salts – their performance is far superior to both cast iron and steel, helping you reduce maintenance costs.



High temperature tensile properties of Type D-2 Ni-Resist ductile iron.

Ni-Resist ductile microstructure X 100. Spheroidal graphite particles allow the metal to develop the full strength and toughness of the high alloy austenitic matrix.

High temperature properties Ni-Resist ductile irons form a tightly adhering scale at elevated temperatures, greatly reducing further oxidation. They resist heat effects up to 1400° F and higher, have excellent thermal shock resistance. From 1100° to 1300° F, Type D-2 has stress rupture properties equal to those of cast HF stainless steel.

Wear resistance Ni-Resist ductile irons have a work hardening austenitic matrix. Graphite particles provide dry lubrication. Both properties work together to resist wear and galling over a wide temperature range.

Erosion resistance Ni-Resist ductile irons work well in wet steam, brine or salt slurries, and high velocity liquids. Their high strength and resistance to cavitation-erosion mean long service life for pump parts.

Controlled expansion Ni-Resist ductile irons have thermal expansivities from about 2.5 up to 10.4 millionths per degree F. You can match them with steels, cast irons, Nickel, Monel* alloy...with aluminum, copper, bronze and stainless steel.

Non-Magnetic properties Ni-Resist ductile irons, Types D-2 and D-2C, are non-magnetic and therefore useful where excessive heat and power losses must be avoided.

Machinability Ni-Resist ductile irons machine as well as common pressure-type gray iron, thanks to the presence of graphite in their structure.

Fluidity in casting Ni-Resist ductile irons have good flowing qualities and permit the making of intricate designs.

These are only the highlights. You can get *all* the facts on this versatile new family of metals by asking us for "Engineering Properties of Ni-Resist Ductile Irons." This 28-page booklet details engineering properties and commercial applications with numerous photos, tables, and graphs . . . gives you the information you need to decide how Ni-Resist ductile irons can help you. You'll also get "Buyers' Guide for Ni-Resist and Ni-Resist Ductile Iron Castings", listing foundries authorized to produce them.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N.Y.

NI-RESIST DUCTILE IRONS

NICKEL ALLOYED IRONS PERFORM BETTER LONGER

Tell What Profits Mean

Somewhere, in some undiscovered cave, there may be some fugitive from a television set who does not know that LS/MFT is shorthand for Lucky Strike Means Fine Tobacco.

But have we ever advertised the fact that LP/MFT? (Less Profit Means Fewer Tools.)

That question was raised by Chairman Roger Blough of U. S. Steel Corp. in an address before the Newcomen Society. It dramatically expresses one of the principal problems facing management today:

Getting the story across about what profits really mean to the man on the street and to the people who make our laws.

Among the misconceptions is the one that corporate profits contribute to rising prices and inflation. Actually, the contributing factors are wage increases and an increasing tax burden.

Another is that all corporate profits go into the pockets of stockholders. Many people are not fully aware of the fact that an increasing share of profits must go back into a business to replace obsolete and worn-out facilities.

As an example, U. S. Steel's property expenditures for 13 years (1946 through 1958) were $3966 million, of which only $2473 million was recovered as depreciation, so a cash expenditure of $1493 million was required. Out of the $1493 million, there was a deficiency of $1050 million in recovering buying power originally invested.

U. S. Steel's cash position improved by only $20 million in the 13 years even though it secured $750 million through the sale of bonds, stock, and property.

Many more misconceptions about the workings of our free enterprise system have equally wide currency.

Management needs to emphasize again and again the fundamental fact that only savings and investment can provide the tools of production that in turn create jobs.

Irwin H. Such
EDITOR-IN-CHIEF

Up at Manitowoc, Wisconsin they're laying the keel for the biggest, most powerful ore carrier ever designed for the Great Lakes. By autumn she'll be ready for launching and next spring will join the Inland fleet, carrying raw materials to Inland's Indiana Harbor Works. She'll be big—a veritable giant among ships—longer than a 50-story skyscraper is high. And she'll be hungry—gobbling more than 50,000,000 pounds of iron ore at a feeding. Her name? The "Edward L. Ryerson," after the former Inland chairman, and one of the oldest names in steel. She'll bear the name proudly while making her contribution to Inland's long-range expansion program—a program designed to meet the growing needs of industrial Mid-America, now and in the future.

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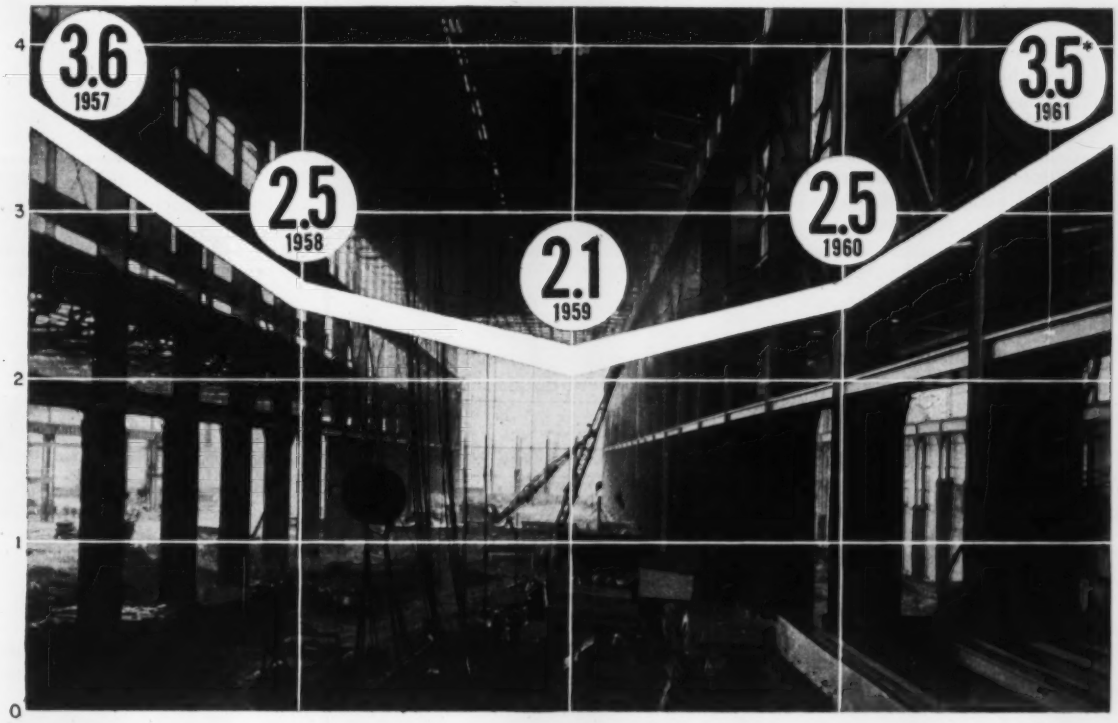
INLAND LIME & STONE COMPANY* *Division

'59: Saucer Bottom for Industrial Construction

Although we won't return to '57 pace until '61, this year should see start of upturn (chart figures show billions of dollars of new construction put in place)



Sources: Labor & Commerce Departments.
*Estimated by STEEL.

LOOK to 1960-61 for a return to 1957 levels in industrial construction. A significant turnaround in spending plans for new equipment and plants should begin at mid-year, forecasts the Associated General Contractors of America.

• **Still in Doldrums**—Toward the end of 1958, new project starts indicated a rapid recovery, but the improvement has failed to materialize so far this year.

Here's the expected level of activity: Last November, the Commerce and Labor Departments predicted that new industrial construction put in place in 1959 would be just over $2 billion (about $400 million off the 1958 pace). Walter Schneider, construction division chief, Business & Defense Services Administration, stands by that prediction. Industrial construction activity last year was 31 per cent below 1957's.

The slow recovery of industrial construction parallels the Commerce-Securities & Exchange Commission forecasts for all capital goods spending (see Page 68). The size: About one-third of all capital goods spending goes for construction. It's also noteworthy that industrial construction activity limped along after the 1954 recession, while the rest of the economy boomed.

• **Contradiction?** — Mr. Schneider points out that many new industrial plants are little more than shells for machinery, so dollar volume for industrial construction may not be the indicator it once was. Increased productivity of machines and men helps reduce physical requirements for plants. He sees some similarity between this situation and current unemployment figures. It is possible we are entering a phase of reduced dollar investment per plant.

• **Background**—New starts in industrial construction topped out in late 1956. The work-completed peak was reached in late 1957. You should look for a definite rise in new starts before you expect the work-put-in-place figures to show a healthy increase.

Leadtime is longer in the $5-million-and-up category. A 1956

high in new starts was followed by an early 1958 peak for work put in place. Mr. Schneider notes that both sets of statistics are still pointing downward in this big project class. You may look for an earlier rise in the under-$5-million class.

• **New Boom?**—The need for new plants looks slight because of current undercapacity operations in many industries, but the "soaring sixties" will require a lot of building. Industry's need to adapt to "vast technological changes" in the next decade will provide an "unprecedented" development of industrial construction, says Harold Hess, 1958 president of the Society of Industrial Realtors. The causes: He cites atomic energy, space and missile research, and automation.

Commenting on a slowdown in new construction by the chemical industry (STEEL, Mar. 2, p. 75), the Manufacturing Chemists Association regards the current situation as a rounding out of one phase of the industry's expansion. MCA officials believe that many indications point to the beginning of a new cycle of expansion—one geared to the swiftly changing industrial and defense demands in this still new age of technology. Another area: Consumer markets that are rapidly increasing in size and number.

MCA notes that construction of facilities for special metals which require chemical processing (including beryllium, boron, titanium, and zirconium) will cost $33.5 million in the next two years.

• **Quick Response** — AGC warns that while dropoffs in industrial construction come fast, manufacturers' intentions to expand also develop swiftly. "We have a strong feeling that the bottom has been touched," says a spokesman. He expects a "pronounced upturn" in the last half of this year, or early next year at the latest.

Federal-Mogul Expands

Federal-Mogul Service, a division of Federal-Mogul-Bower Bearings Inc., Detroit, will add 43 per cent more space. The division plans to install an electronic computer in October for order processing and inventory control. Eventually, the entire center will be automated.

Capital Investment Rate Continues Moderate Upturn

CAPITAL INVESTMENT will gain this year, but government experts predict a slow and moderate uptrend.

This year's expenditures are estimated at $31.8 billion, compared with $30.5 billion last year. It would be the third largest outlay in history, though well below the record $37 billion of 1957 and $35 billion in 1956.

The latest survey by the Department of Commerce and the Securities and Exchange Commission reveals the adjusted annual spending rate will be $32.03 billion in the second quarter, vs. $31.16 billion in the first quarter and $29.97 billion in 1958's fourth quarter.

• **Manufacturing Sets Pace**—Manufacturing reflects the gradual rise in new plant and equipment investment. Second quarter rates have crept above the $12.03 billion actual spending of last year, but they are well below the $15.96 billion pace in 1957.

The spending rate for durable goods is keeping abreast of last year's actual spending of $5.54 billion, but it's under 1957's outlay of $8.02 billion. Nonferrous spending is a little below its rate in the last quarter, but all other facets of durable goods manufacturing will show an improvement.

Railroad expenditures are expected to show a big upsurge over what they were in the last two quarters. Mining outlays reveal a continuing downward trend. Public utility spending has stabilized after dropping below 1958's last quarter.

Expenditures for New Plant and Equipment

(Billions of dollars seasonally adjusted at annual rates)

	4th Quarter 1958	1st Quarter 1959	2nd Quarter 1959
Manufacturing	10.58	11.56	12.25
Durable Goods	4.86	5.35	5.74
Iron and Steel	0.90	0.98	1.16
Nonferrous	0.34	0.40	0.39
Electrical Machinery	0.44	0.48	0.51
Machinery (except Electrical)	0.79	0.84	0.95
Motor Vehicles	0.46	0.57	0.63
Transportation, other than Motor Vehicles	0.36	0.36	0.38
Mining	0.97	0.95	0.90
Railroads	0.58	0.69	0.92
Transportation, other than Rail	1.62	1.90	1.84
Public Utilities	6.26	6.08	6.10
Commercial & Other	9.96	9.01	10.02
Totals	29.97	31.16	32.03

Source: Commerce Department, Securities & Exchange Commission.

Our Steel Pay 2 to 8 Times That of Most Scales Abroad

(U. S. dollar averages for 1957)

Country	Avg Hourly Earnings	% of U. S. Rate	Total Employment Costs
Austria	$0.471	16.1	$0.613
Belgium	0.757	26.0	0.962
Denmark	0.874	30.0	0.930
France	0.583	20.0	0.878
Germany (West)	0.694	23.8	0.974
Great Britain	0.827	28.4	0.867
Italy	0.550	18.9	0.774
Japan	0.361	12.4	0.429
Luxembourg	0.969	33.2	1.305
Netherlands	0.615	21.1	0.948
Norway	0.916	31.4	1.035
South Africa	1.286	44.1	1.391
Sweden	1.076	36.9	1.102
U. S.	2.917	—	3.220

Figures adapted from data of United Steelworkers of America and International Metalworkers' Federation, Geneva, Switzerland.

UNITED STATES steelworkers earn eight times as much as their counterparts in Japan and three to five times as much as Belgian, French, and German steelmen whose production also is being shipped to America in increasing tonnages.

Yet United Steelworkers President David McDonald will seek "substantial" wage increases in negotiations that begin next May in New York.

• **Admitted**—Even the union admits the variations. ("It is clear that most foreign competitors have a labor cost advantage over American steel producers," says Meyer Bernstein, USW's international affairs representative.) He has this to say about the situation:

"This (the wage difference) in our opinion is for the most part unjustified. It represents a kind of cultural lag. The USW is trying to reduce the differentials. We are doing this under the auspices of the International Metalworkers' Federation, a trade secretariat with headquarters in Geneva."

• **USW's Campaign** — Metalworking unions with a membership of some 8 million throughout the Free World are affiliated with IMF. USW is preparing for a conference of IMF's Iron & Steel Department later this month in Vienna.

The American union gives encouragement and renders assistance to European union campaigns to bring about what is called "harmonization upward" in wages.

• **Even with Fringes**—Even when you take fringe benefits into account, American employment charges are much higher than those abroad. For example, in 1957 the all-inclusive labor costs for West German steel companies amounted to only 18.8 per cent of sales, while the average for all American steel companies was 36.3 per cent. The Japanese average was 12.8 per cent.

Even though it admits the wage differences, the union continues to deny that American labor is pricing itself out of world markets. Says Mr. McDonald: "That talk is just a smoke screen put up by industry to make the steelworkers dissatisfied with their union." He claims that the wire producers, particularly hard hit, haven't kept pace with improved technology of European producers.

• **Timetable**—The USW's executive committee will meet late this month or early in April to decide on demands and strategy in the coming wage talks. The 170-man wage policy committee meets Apr. 30 and May 1 (probably in New York) amid the blare of publicity to endorse what the executive committee decided earlier. Bargaining starts May 18 in New York's Hotel Roosevelt.

USW in Valve, Pump Move

United Steelworkers wants a common contract expiration date of Aug. 15 for the more than 52,500 workers it represents in the valves and fittings, pumps and compressors industries.

USW says: "This would end management's strategy of playing one local against another."

In addition to a common expiration date—with allowances for a 30-day leeway one way or the other—the union will also try to win these concessions:

1. Supplemental unemployment benefits plans.

2. Cost-of-living adjustments for workers.

Another objective will be to organize the white collar and technical people.

The steel union has 68 locals in the valves and fittings industry and 49 in the pumps and compressors field.

Installment Buying Plans Can Build Your Sales

"Your own financing activity is a good sales tool . . . the American businessman is a good credit risk," says Clark's John Wood

ASK YOUR SALESMEN this: How many more equipment sales would you have made last month if you could have offered prospects time payments?

Installment buying is one of the best sales tools ever devised for the retail merchant—industry is just beginning to tap the potential. One popular approach which you can consider: Starting your own financing program. It has these advantages:

- For many medium and small size firms, credit to purchase equipment items is not available from the usual banking sources.
- In numerous instances, a sale can be clinched more easily if the seller can provide adequate credit terms so that a third party doesn't have to be called in.
- In some situations (particularly to dealers), a firm with its own financing organization can offer more attractive credit terms than is available through conventional credit channels.

• **Prime Example** — Clark Equipment Co.'s experience illustrates how you can investigate the possibilities. In 1953, Clark began experimenting with financing the sale of industrial lift trucks through its dealerships. The idea proved to be an excellent sales tool, and Clark formed its own financing corporation a year later.

Today, Clark's financing activity is a $40 million business. For technical reasons, the company has three financing organizations:

Clark Equipment Credit Corp., which extends credit to dealers; Clark Leasing Corp., which handles consumer credit; and Clark Rental Corp., which was recently set up to rent industrial lift trucks on a full maintenance and repair program.

• **Offers Blueprint**—John R. Wood, vice president, has been the chief architect in building Clark's financing program. He relates: In considering whether to investigate your firm's potential, these are the three key factors:

1. Check the price range of your products. The price has to be sufficiently high so that outright purchase poses a substantial obstacle for many customers. Yet too high a price may prove too much for you to carry.

Mr. Wood considers his firm's product price range good. Most items — lift trucks, construction equipment, trucktrailers — range from $5000 to $25,000. But Clark can handle the occasional $50,000 and $75,000 transaction with ease.

2. Estimate the potential number of transactions you'll handle. The costs of operating a financing organization are substantial. You must have enough transactions and dollar volume to justify the costs.

About 20 per cent of Clark's customer sales are made under an installment credit plan. Around 35 per cent of the sales to dealers are financed.

3. Are your products repossessible? Do they have a substantial resale potential? "Our experience has been excellent; repossessions are low," Mr. Wood emphasizes. "But nevertheless, the headaches that would accompany such action on custom equipment are obvious."

• **Credit Rates** — Interest rates to customers may appear relatively high—8 to 12 per cent—depending upon the money market and credit factors. But to the medium and small firms (large firms rarely ask for credit), the rates are still attractive when it's a question of getting new equipment to improve productivity and lower costs. Most firms, including Clark, can offer lower interest rates (often 6 per cent) to dealers.

Many companies are unable to jump right into the financing business—it takes big money, plus credit experience with large money sources. Clark chose to "grow" into the business by working with a large bank.

• **Contract Terms**—In the early transactions, the bank extended credit to Clark's customers. Clark guaranteed $1 for each $5 the bank put up. In all cases, the bank had the final decision on whether a customer got credit. Most installment contracts and leases with options to buy have two to five year terms.

As volume grew and the bank became better acquainted with Clark's operations, customers, and products, a point was reached where it was advantageous for Clark to form its own financing organization. It now borrows large sums of money from banks and other sources to make small loans to customers and dealers.

• **Money Costs**—The interest rates

that company financing organizations pay for large sums of money vary with the size and reputation of the firm. Large and well established ones can generally borrow at the prime interest rate—currently 4 per cent. Smaller firms may have to pay an additional 0.5 or 1 per cent.

The borrowing ratio also varies. Smaller organizations may have to put up $1 for each $3 or $4 they can borrow—some of the nation's largest organizations can get up to $15 for each $1 they put up.

When exploring the possibilities of your own financing activity, make sure you contact a progressive banker. There are many who do not understand the marketing of industrial equipment—this is one of the reasons industrial installment buying has lagged.

"Frequently, we encounter this type of situation," Mr. Wood relates. "A customer who has been unable to secure credit from his local bank to purchase equipment will ask us for credit. Our requirements and investigations are just as rigid as the average bank's, and one of our first contacts is with the customer's bank for his rating. The local banker, seeing the request, reconsiders his position—'if they can finance it, why can't we?' In the end, the bank grants the credit—Clark made a sale, the customer obtained credit, and the local bank also profited."

Canada Plans Steel Plant

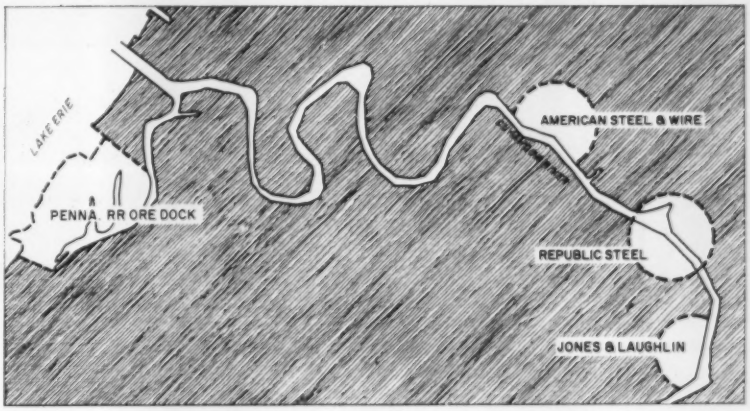
A steel processing and producing complex will be built at Contrecoeur, Que., 30 miles northeast of Montreal. Dominion Steel & Coal Corp. (Dosco), Montreal, is developing the project with Belgian, British, and Canadian interests.

Initial plans call for hot and cold rolling mills costing $50 million. Eventually, a plant for basic steel production will be established.

Butcher & Hart Expands

Butcher & Hart Mfg. Co., Altoona, Pa., plans to expand its plant 50 per cent. A major part of new machinery will be used to convert hot rolled rods into cold drawn material. The firm makes industrial fasteners.

Belt to Cleveland Steel Mills To Bypass Kinky Cuyahoga



THE PENNSYLVANIA Railroad's plans for a conveyor belt from its Cleveland lakefront ore dock to the mills of three major steel companies have received encouragement from Cleveland's Mayor Anthony J. Celebrezze.

American Steel & Wire Div. of U. S. Steel Corp., Republic Steel Corp., and Jones & Laughlin Steel Corp. would be potential customers for the overland conveyor. It may be built over or alongside railroad rights of ways. Potential volume: More than 11 million gross tons of iron ore were unloaded at the Cleveland port during 1957.

Studies of the conveyor's feasibility will be continued by the steel companies, the Pennsylvania Railroad, the city of Cleveland, and Riverlake Belt Conveyor Lines Inc.

• **Possible Savings**—Of the 250 vessels plying the Great Lakes (see Page 151) many are owned by steel companies. They could save many manhours if a conveyor were used to move ore from boats while they were docked at piers in the outer harbor.

• **Twisting Course**—The three steel companies have plants on the kinky Cuyahoga River which has long been a problem to lake carriers. Though the river provides a natural 5 mile harbor from its mouth in Lake Erie to its head of navigation, its narrow, tortuous course has six major curves. It takes a tug 4 hours of maneuvering to get a fully laden boat up the meandering stream. For the return trip, two tugs push and tow the empty vessel stern first back to the lake.

The river's turning basin and another section, appropriately called Collision Bend, are wide enough to permit boats to turn around. But congestion hazards created by boats moored in the areas, plus the vagaries of the wind, prompt most captains to call for tug services. The cost: About 9 or 10 hours for a round trip and about $1000 in tug fees.

• **Traffic Factor**—The navigable 5 miles of the river are spanned by 27 bridges which are swung or lifted out of the way when an ore boat is being moved along the tricky waterway. Because the river divides Cleveland's east and west sides, vehicular and rail traffic are sometimes held up during a boat's passage.

• **Another Possibility?**—Plans for building a cargo carrying conveyor belt from the Ohio river valley to northeastern Ohio "will never be given up as long as the idea is sound," says H. B. Stewart Jr., chairman, Akron, Canton & Youngstown Railroad and its subsidiary, Riverlake Belt Conveyor Lines Inc.

WILL YOU HELP?

STEEL surveyed 918 top metalworking executives to learn what type depreciation reform they favored (Mar. 2, p. 69). The results: 40.1 per cent want the bracket system; 37.7 per cent want faster writeoffs, using the present useful life concept; 12.7 per cent want reinvestment depreciation; 1.8 per cent want higher first year credit. (At present, you can write off 20 per cent in the first year of acquisition if the property's cost doesn't exceed $10,000.)

Needed is majority support for some kind of reform before Congress will act. To help you evaluate the approaches favored, STEEL last week explained the bracket system. This week we look at the faster writeoffs advocated by Machinery & Allied Products Institute (MAPI). Later, we'll describe the two other methods.

An aid to the cause may come from the Treasury Department. It is considering surveying 2500 corporations to find out what they want in reform and how they depreciate now. The Bureau of the Budget's committee on forms has already approved the questionnaire, but it has not been mailed.

Relief will come only if you who are sharply affected by depreciation policies will keep plugging for action.

WILL YOU HELP?

Depreciation Reform: MAPI Plan?

THE SECOND most popular method of depreciation reform was developed by Machinery & Allied Products Institute's research director, George Terborgh.

It would retain the present concept of useful lives but allow a triple declining balance writeoff, or alternatively, an initial allowance of the British type sufficient to get a similar result.

• **Partial Reform** — The Internal Revenue Code of 1954 authorized two faster methods of tax depreciation for assets acquired new after 1953—sum of the digits and double-rate declining balance.

While the new methods provide a realistic pattern of writeoff, they do not provide an adequate amount. From 1954 through 1958, corporate fixed asset expenditures have averaged $27.4 billion a year, but depreciation and amortization allowances have averaged only 61 per cent of that, or $16.8 billion annually.

• **Inflation, the Villain** — Three years ago our historical cost depreciation was deficient by about $6 billion a year on business assets alone, as compared with the current-dollar equivalent. So sharply have capital plant and equipment prices risen in the last 36 months that the annual deficiency is now between $6 billion and $8 billion.

• **Two Routes to Reform**—Postwar liberalization of tax depreciation abroad has fallen into two main groups: 1. Those that abandon the original-cost basis for a higher one adjusted for the effects of inflation. 2. Those that adhere to original cost but speed up the recovery.

The first type is found only in countries that experienced drastic

GEORGE TERBORGH developed this approach to depreciation reform. He's research director of Machinery & Allied Products Institute, Washington

inflation during and since the last war. Historical cost is translated into current value, and tax deductions are stepped up accordingly. France and Italy are good examples. As a rule of thumb, it has taken inflation of 200 per cent or more for nations to abandon historical costs.

The second route (faster writeoffs) has been taken by such nations as Britain, West Germany, Canada, and Sweden. Britain adds 25 per cent to normal depreciation rates and, in addition, a special initial writeoff of 30 per cent of the cost of equipment and 15 per cent of the cost of buildings and structures. West Germany and Canada permit the recovery of more than 50 per cent of the cost of most equipment in the first three years of the asset life. Sweden allows a complete writeoff over five years, with a 70 per cent recovery in the first three years of service.

And the U. S.? We have had as much inflation as many of the countries mentioned, but our government has done less than any of them in protecting taxpayers.

• **Question of Inflation** — Says MAPI: "Since the double-rate declining-balance writeoff was approved in the 1954 code, we assume that it is satisfactory in the absence of inflation." But we have had inflation, so MAPI asks:

At what multiple of the straight-line rate must the declining-balance writeoff be applied to allow for inflation?

• **The Answer to Inflation**—MAPI's solution: A triple rate, or alternatively, the British approach with a high initial allowance. Here's what the speedup would do to total U. S. business tax depreciation (in comparison with use of the double rate) assuming:

1. That it is applicable only to assets acquired new after 1957 (MAPI first made this proposal public in June, 1958).

2. That it is applied to present service life estimates.

3. That new installations after 1957 will regain their 1956-57 level by 1960 and will rise 5 per cent annually thereafter.

• **Results**—The increase in depreciation by the triple rate starts in 1958 at a little under $1 billion. Then it rises rapidly for several years, nearing $6 billion around 1963. Beyond that, the rise is relatively gradual.

If you use the British approach, the increase in depreciation starts high—around $7 billion for the first year—and declines gradually.

• **Pros and Cons**—The major advantage of MAPI's reform proposal is that it keeps our present useful life concept and will not be a radical departure. It also would do the job of stopping capital erosion.

The chief criticism is that it's not as simple as other proposals (such as the bracket system).

Although students of depreciation may disagree on methods of reform, all agree that reform is needed. All would echo this comment from MAPI's president, Charles W. Stewart: "A major overhaul of the tax structure is absolutely prerequisite to the continued health and growth of this country."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Depreciation Practices in Other Countries

ARGENTINA
Revaluation by years of acquisition (1940 and earlier—300 per cent of original cost; 1952 and 1953—110 per cent). 50 per cent of cost for new plant and equipment is written off in first year.

AUSTRALIA
Declining balance method on original cost (examples: Smelters—12½ per cent a year; foundries—7½ to 10 per cent). Special rates are allowed on application.

BELGIUM
Revaluation by years of acquisition (1918 and earlier—14.32 times original cost; 1943—1.48 times original cost). Depreciation on original cost. In addition to ordinary rates, another 30 per cent is allowed on cost of new plant, spread 10 per cent per year over first three years.

BRAZIL
Revaluation by years of acquisition (1929 and earlier—10 times original cost; 1949 and 1950—two times original cost for excess profits tax purposes).
Machinery is depreciated at 10 per cent a year. There is no depreciation on buildings.

NETHERLANDS
If approved by the minister of finance, accelerated depreciation is allowed—one-third of the cost of a new facility is written off at an accelerated rate (often in one year) and the remaining two-thirds at normal rates. Normal rates on equipment are 10 per cent annually.

INDIA
The most liberal in the Free World. Normal rates range from 7 to 25 per cent on a diminishing balance basis. Additional depreciation equal to the normal writeoff is allowed on all new assets for a five-year period. Double shift additional allowance is also provided for up to 50 per cent of normal depreciation. If there aren't sufficient profits in a year to absorb the normal and additional depreciation, the deficiency can be carried forward indefinitely against profits of subsequent years.
What's more, the country allows development rebates equal to 25 per cent of the cost for all new machinery and plant installed after Mar. 31, 1954. The rebate is in addition to other depreciation allowances and is not taken into account for determining the written down value.

JAPAN
Voluntary revaluation is allowed on residual value of assets as of Jan. 1, 1950, 1951, 1952, 1953, and 1954, using the government's price indexes. A revaluation tax of 6 per cent of the writeup is assessed.

MEXICO
Normal rates on machinery are 10 per cent of original cost. Accelerated depreciation is granted if applied for.

(See STEEL, Mar. 16, p. 66, for Canada's plan and accompanying story for the program in France, Italy, Britain, West Germany, and Sweden)

Here's What It Takes To Fulfill ASW's Mission

HUNT:

Detection equipment and components
Target identification gear
Underwater communication systems
Oceanography equipment
Mine-hunting sonar

ATTACK:

Search and attack aircraft
Naval surface vessels
Hunter-killer subs

KILL:

Bombs—Shells—Rockets
Mines—Torpedoes—Depth charges

Antisub Contract Tally: $132 Million

MANY EYES are fixed on outer space as the battleground of the future, but more and more people are switching their gaze to "liquid space." The oceans that surround us have traditonally been America's first line of defense—they now offer a readymade route to a massive Soviet attack on the U. S.

• **Here's Why**—Since World War II, Russia has made submarine production a prime military goal. She has an estimated 450 subs (the largest peacetime fleet the world has ever seen). The U. S. has 113.

• **Problem**—The submarine has developed faster than adequate defenses against it. As Rear Adm. John S. Thach puts it: "After 40 years, submarines are finally approaching the true submersible, and the closer they get, the tougher antisubmarine defense becomes. The day of catching submarines on the surface with radar is almost gone. They're exposing less and less above water. They're going deeper and staying down longer."

Against such formidable opposition we have only a handful of hunter-killer groups and an underwater detection system whose status parallels that of our air defenses before radar.

The need for defense of our shipping lanes has sparked antisub activity. The lifeline of the Free World is more than 60,000 miles of vital ocean routes. For example, every day more than 2000 merchant ships are in the North Atlantic alone. They're sitting ducks for a concentrated enemy attack. Remember what Hitler did to shipping at the start of World War II with only 57 submarines?

• **Stepup** — The ASW Program lagged for years but now may be coming into its own. The Navy terms it the number one priority project. This year the Navy received around $132 million for ASW research and development (excluding vehicles and certain components). Look for the figure to rise sharply over the next few years.

It means a large potential market for metalworking. "Every area of industry can make a contribution to ASW," says Admiral Thach.

• **What's Needed** — The checklist above shows the kinds of materials and equipment the ASW program requires. Probably the most vital need today is for an effective system of detection. Present sonar doesn't have enough range.

Classification and identification of targets are related problems. Once you've made a "contact," is it actually an enemy submarine, a school of fish, or only a maverick current? Submariners say they often don't know.

• **Underwater Geography** — The ocean floor has huge mountain ranges, deep valleys, and other topographical features which can screen a submarine's movements. We're pretty familar with the waters adjacent to the U. S., but any submariner will tell you: Once you get 100 miles out, our knowledge becomes extremely sketchy. A committee of the National Academy of Sciences states the situation bluntly: "We know less about many regions of the oceans today than we

know about the lunar surface."

The committee recommended this government spending over the next ten years:

- $213 million to build a modern fleet of 70 oceanographic research vessels (we have a dozen, compared with the Russians' 60).
- $100 million to develop new devices for exploring the oceans.
- $146 million for construction of oceanographic shore facilities.

• **Team Effort**—In the near future, few submarines will be bagged singlehandedly. We'll utilize land-based and carrier aircraft, ASW helicopters, destroyers, and antisubmarine submarines—all metalworking products. The armaments will require more sophisticated communications systems—more metalworking products.

Once the enemy sub has been detected, it will be destroyed either by glamour weapons like rockets and acoustic torpedoes, or by more conventional means such as depth charges—more metalworking items.

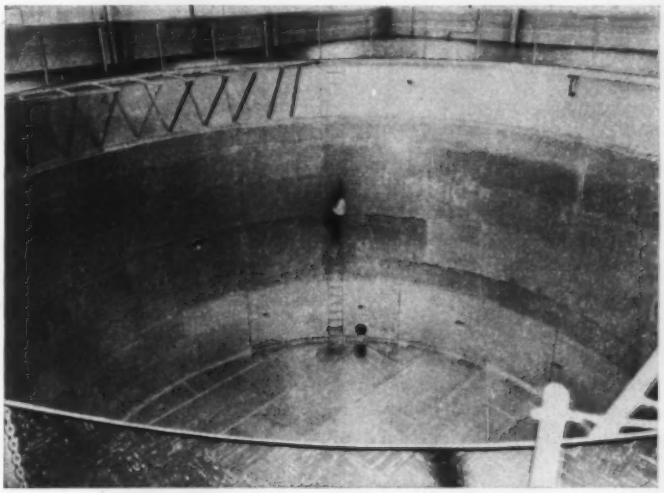
• **Already Active** — Many metalworking companies (both large and small) are active participants in the ASW program (see STEEL, Mar. 9, p. 36). Here are a few examples of what some are doing.

Clevite Corp., Cleveland, has been researching and building ASW gear for several years. The firm designed and built the Mark 43 acoustic-homing antisubmarine torpedo, an ASW missile, and a torpedolike submarine simulator for training purposes. The company is working on several ASW problems, including underwater sound detection systems. Clevite's role: "We conceive and project problems the Navy is going to face in ASW," says J. K. Nunan, vice president for electronics.

Reynolds Metals Co. is building an all-aluminum submarine (*The Aluminaut*) which the company believes "could lead to a new concept of underseas warfare in reconnaissance, attack, and sentry duty for a national warning and defense system." It's designed to carry three men and 3400 lb of instruments, will be 48 ft long, and have a 30 ft cylindrical pressure hull made of 6 in. aluminum plates.

Westinghouse Electric Corp. recently announced what it terms "a broad co-ordinated program designed to assist military forces dealing with antisubmarine warfare." Says the company: "All corporate facilities will be called into play to solve urgent problems in this field." (See the case study on this page for how General Dynamics Corp. co-ordinated its ASW activities.)

• **Wrap-up**—It's evident the ASW program will grow. If you feel you're not able to contribute to present research and development work, it still might be wise to study up on the field, ASW observers advise. Reason: When breakthroughs and advances do come, you'll be in a better position to take on hardware contracts.

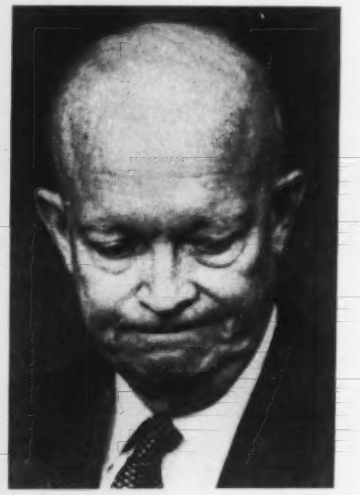


GENERAL DYNAMICS CORP. recently took a look at the growing complexities of antisubmarine warfare and decided that something besides traditional research and development programs were needed to meet the challenge of the Russian underseas fleet. The plan: Formation of a company-wide task force to oversee the air, underwater, and surface aspects of the program being carried on by the corporation's Convair, Electric Boat, and Stromberg-Carlson divisions and Canadair Ltd.

In the words of General Dynamics' president, Frank Pace Jr., the group (ASW planning and co-ordinating committee) has three major responsibilities: 1. Guide and direct the divisions in comprehensive planning for future antisubmarine warfare equipment. 2. Co-ordinate ASW system activities throughout the corporation. 3. Stimulate and insure continuous exchange of ideas on antisubmarine warfare systems and subsystems.

• **Top Men Needed**—General Dynamics reasoned that having a committee wasn't enough. It had to be able to make decisions and command action. Result: The group is composed of a senior vice president, four vice presidents, an assistant division manager, and a project co-ordinator.

One of the committee's early recommendations became a reality last month when a highly instrumented acoustic test tank facility was put into operation at the Stromberg-Carlson Div. in Rochester, N. Y. It will hold 400,000 gallons of water (see photo). Its purpose: To carry out basic research in sonar and to study new techniques for detecting the quiet nuclear submarines. Research data will be fed back to the divisions as they become available.



NEA

Steel Prices Worry Ike

THE WHITE HOUSE is exerting pressure on the steel industry to hold the price line. Ike remarked last month at a press conference: Steel companies "wouldn't really have to have an increase (price) if this wage drive was measured by productivity gains." The President is no economist, but his thinking is shared by one—Woodlief Thomas, adviser to the Federal Reserve Board.

Mr. Thomas claims: "It is most likely that some wages and prices were raised or kept up too high in 1957 and thus choked off demands. Moreover, they have not been adjusted downward sufficiently to stimulate demand since then. This is particularly true of the automobile industry with respect to styling as well as to prices. The principle is the same in either event. It is no doubt also true of the steel industry. At present, the threat of further increases in steel wages and prices may be stimulating a surge of buying that might not last after the event."

Significance: Both the Fed's spokesman and the President talk about wages and prices, not prices alone. But pressure is largely against the steel industry to hold its price line after the expected summer wage increases.

Big Issue of the '60 Election

The administration knows the consumer price index will be the major issue of the 1960 Presidential campaign (if we avoid open conflict with the Russians). Economists are nearly unanimous in predicting higher consumer prices this year and next as the recovery picks up steam. Democrats and labor leaders will have a readymade whipping boy in the steel industry (and "Republican big business interests") if there is a steel price hike this summer. So Ike, needled by some of his closest advisers (who are not of the most conservative economic stripe), seems to miss no opportunity to complain of the dangers of inflation and to exhort the need for moderation in the coming steel negotiations.

He desperately wants steelworkers to settle for little more than the auto workers got last year. Yet he can't pressure a labor movement which has had the bit in its teeth since November. Will his efforts with the steel industry prove successful? Washington sources close to the industry are reluctant to go out on a limb this early. But they admit "the public relations benefit" of a minimum price boost is well understood.

Washington Opinion: No Strike

Perhaps Ike's thinking is dominated by the belief among some of his top labor advisers that there will be no strike. At least two think this way:

1. Steel is more conscious than ever of its public role.

2. Companies can offer some modest increases to the unions.

3. The steelworkers won't dare turn down an offer of modest increases in the light of unfavorable publicity about spurring inflation and when a strike could bring little more (assuming the steel firms hold to their original offer).

Conclusion: Government labor experts don't think Dave McDonald, USW chief, can take another long strike.

One adviser offers this thought: "You don't get a serious strike when the drums have been beaten for months in advance. It's like prematurely announcing your availability for political office. Bad strikes are those that slip up unheralded by such propaganda as we are experiencing now."

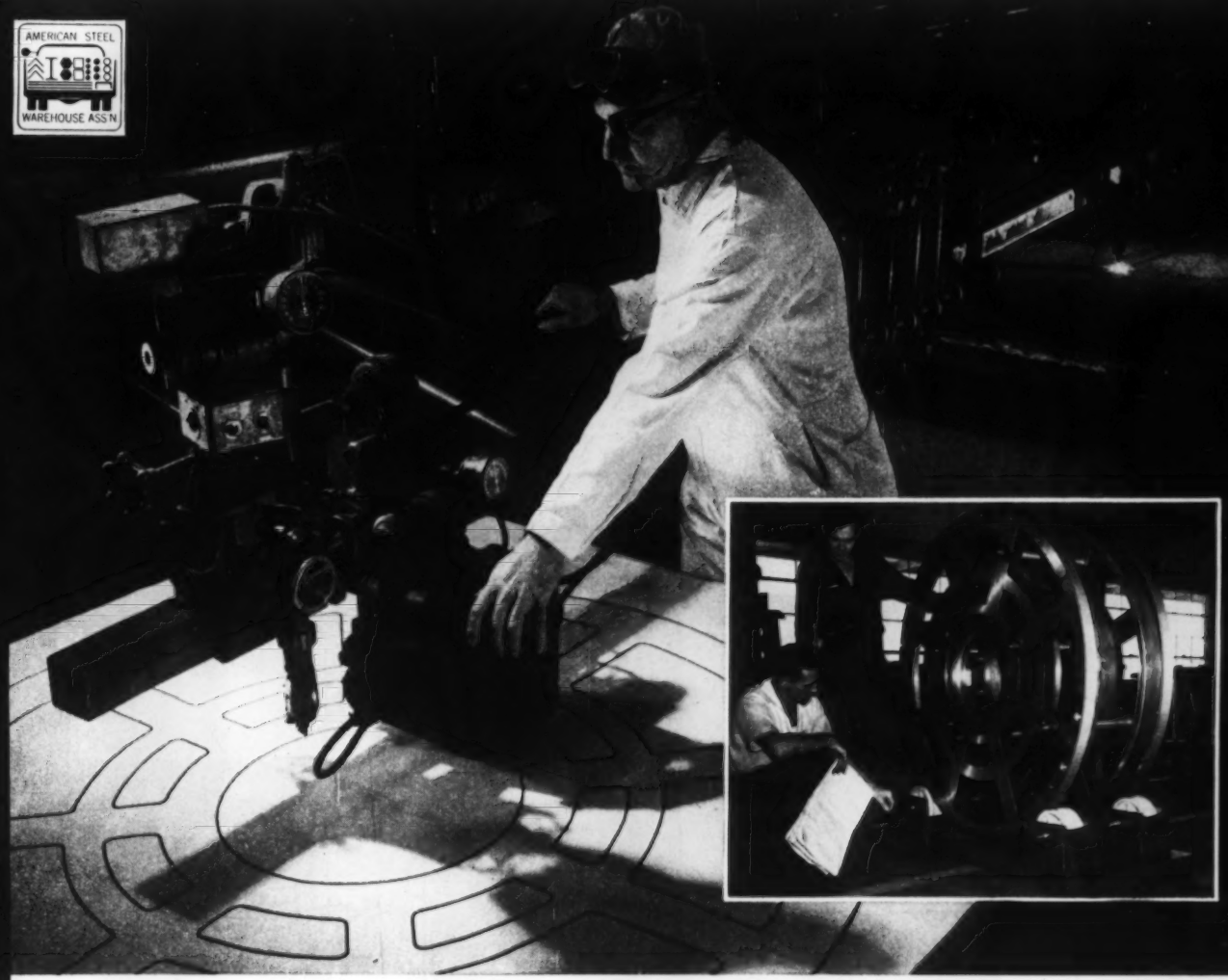
Primes and Subs Will Be Heard

Look for the Senate Small Business Committee to continue its interest in missile contract opportunities for small companies. Hearings may not be held, but the staff will have a report this session of Congress.

In checking relations among prime defense contractors and their subcontractors, the committee will avoid hearing long spiels by the three services. Instead, they'll listen to five subcontractors in the latter part of April and examine the subcontracting programs of five primes later. The Small Business Administration will be called to show how it is helping firms enter the defense field.

OCDM Controls BDSA on Mobilization

The Business & Defense Services Administration will get about the same amount of money for fiscal 1960 as it did in fiscal 1959. An important change: The Office of Civil & Defense Mobilization will control all BDSA funds designed to serve a mobilization function. Rumors that BDSA is due to be revamped have cropped up again. One source says he recently spotted a New York-type efficiency expert in the quiet halls of the Commerce Department Building. A similar firm is checking OCDM's organization—"long overdue for some big changes," notes an insider.



Precision electronic-eye flame cutting on this multiple welder component saved many costly hours by eliminating virtually all subsequent machining.

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Write us your estimate of the number of tons of cold finished carbon steel bars in stock at steel service centers on January 1, 1959. If you are closest to the estimate being developed by the American Steel Warehouse Association*, the $100 is yours. Don't be conservative because the tonnage is always big—an excellent reason why your steel service center can give you terrific service when you need cold finished steel bars. All entries post marked on or before midnight May 17, 1959 will be considered. Please mail your estimate to "Contest," Bliss & Laughlin, Inc., Harvey, Illinois.

*Based on projections made from A.I.S.I. 16 Report.

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St. Lawrence Seaway Tolls

	Montreal-Lake Ontario	Welland Canal	Total
1. Per gross registered ton of vessel	$0.04	$0.02	$0.06
2. Per ton of bulk cargo	0.40	0.02	0.42
3. Per ton of general cargo	0.90	0.05	0.95
4. Per passenger	3.50	4.00	7.50
5. Pleasure craft* (minimum)	14.00	16.00	30.00
6. Other vessels* (minimum)	28.00	32.00	60.00
7. Partial transit from Montreal to Lake Ontario			15 per cent of applicable toll per lock
8. Partial transit of the Welland Canal			50 per cent of applicable toll if at least one lock is used

*Subject to items 1, 2, 3, and 4, if applicable tolls are above minimum. Minimum charge for partial transit for pleasure craft, $2 per lock; other vessels, $4 per lock.

Setting of Seaway Tolls Opens Industry Planning

NO ONE IS HAPPY with the tolls to be levied on ships transiting the St. Lawrence Seaway. Too high, say Great Lakes shipping interests. Too low, counter competing forms of transportation, particularly the railroads.

• **The Facts**—Says E. Reece Harrill, (he's assistant administrator, St. Lawrence Seaway Development Corp.): The tolls will pay off the seaway's debt to the U. S. Treasury in 50 years, as required by law. Total cost to Canada and the U. S. will probably run $470 million when final figures are in. Uncle Sam's bill is $130 million, including the interest the corporation must pay on the borrowed funds.

Mr. Harrill expects 29 million tons of cargo to transit the seaway this year, providing $15 million in revenue. By 1969, the seaway will reach capacity operations of 50 million tons of cargo, with annual revenues of $28 million. Tolls (see table) will cover maintenance and operating costs.

He hints that his estimate of 50 million tons in ten years is conservative. If the seaway provides more economical transportation to and from the Midwest, capacity operations could be reached sooner. Capacity could be increased if Canada should decide to twin the locks of the Welland Canal, connecting Lakes Ontario and Erie. The tolls also take into account the deepening of the channels connecting Lakes Superior, Huron, and Michigan by 1962, as planned by the U. S. Army Corps of Engineers.

• **Small Factor**—Mr. Harrill's answer to the conflicting claims on tolls: They are "one of the smaller elements of the cost of transiting the seaway," and therefore should cause little concern. Under law, the tolls must be reviewed within five years. The corporation has the right to change them at will, if they don't appear adequate to meet the 50-year payoff deadline.

• **Army Recommends**—The Army's Board of Engineers for Rivers & Harbors has recommended these improvements in facilities along the Great Lakes: Duluth-Superior harbor channels to be deepened to 23 ft and 27 ft; Indiana Harbor, Ind., (Chicago) channels to 27 ft, 28 ft, and 29 ft; Erie, Pa., Harbor to 28 ft and 29 ft.

For work to begin, the recommendations must be approved by Congress.

Battelle Builds New Lab

Battelle Memorial Institute, Columbus, Ohio, will build a laboratory for plutonium study. It is scheduled to be operating by midsummer. Plutonium is a nuclear reactor fuel.

Eyes of the fleet

To search out the enemy task force, and act as a mobile early warning station. This is the mission of the Triton — the Navy's largest submarine and the newest atomic-powered member of the Silent Service.

Measuring 447 feet in length, the Triton, built by General Dynamics Corporation's Electric Boat Division, is officially known as a radar picket submarine.

The Triton carries with her two contributions from National Tube—National Seamless Pipe and Tubes in both carbon and stainless steels and National Seamless Steel Cylinders. National Seamless Steel Cylinders are used to house compressed oxygen and to store compressed air for torpedo firing.

This is another significant achievement for National

Tube. In almost every type of tubular installation aboard ship, from stem to stern, you'll find National Tube is more than qualified to handle your most difficult problems. Remember, for more than 80 years, National Tube has been a leader in the manufacture of tubular products for all types of building and industrial uses generally. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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Air Weapon Systems Gulp Metals:

FOR the first time, you can get a good idea of how many pounds of metal it takes to make airframes for some of our more important defensive weapon systems (see table.)

Aircraft listed: The Stategic Air Command's biggest bomber (B-52); SAC's newest and fastest medium bomber (B-58); the tanker aircraft needed to supply them with jet fuel in midair (KC-135); and the Air Force's important fighter (F-106). Defense Department and Aircraft Industries Association also released the figures for materials needed to build the Matador surface-to-suface missile and the Falcon air-to-air bird. (Later Falcon types, Gar III and IV, take more materials than Gar I and II.)

Detailed material requirements for more advanced weapons remain classified. It is important to note that the weights given are for metals delivered to the manufacturer and bear no proportionate relation to the weights of the finished products.

• **Titanium Submarine?**—Advances in military metals are coming fast, say Pentagon sources, so you can't count on this list as a firm guide to tomorrow's requirements. Looking far ahead, titanium is still regarded as the glamour metal for the military systems requiring large tonnages because of such properties as corrosion resistance.

One source in Washington government circles tells STEEL that the delay in Russia's nuclear submarine program may stem from a decision to build one of titanium rather than steel.

The aluminum sub is with us, Reynolds Metals Co. reports. It is still in the preliminary design stage.

Strength of aluminum alloys in relation to weight "contribute a buoyancy not possible with other metals," claims the company. (See Page 74.)

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

(All figures in pounds)	AIRCRAFT B52D Bomber	B58A Bomber	KC135A Tanker	F106A Fighter	MISSILES TM-76A Matador	GAR-1D Falcon
MISC. BASE METAL ALLOYS						
Nickel Base Alloys						
Rod & Bar Products; Total				10		
Wire & Wire Products; Total	103		44	1		
Nickel Alloys						
Nickel Alloys 5.00 to 29.99% nickel content incl.		407				
Nickel Alloys 30.00 to 49.99% nickel content incl.		83				
Nickel Alloys 50.00 to 100% nickel content incl.		129				
Titanium & Titanium Base Alloys						
Titanium Forgings		4,178		5		
Plate, Sheet & Strip Products	949	1,375	334	435		
Rod & Bar Products; Total		1,322		340		
Pipe & Tubing; Total		11		3		
Solders						
Silver Base	18		2			
Tin Base	17		12			
FERROUS METALS						
STEEL						
Stainless Steel—nonnickel bearing						
Castings	671		46	2		
Bars, CF	15					
Bars, HR	282					
Pipe & Tubing Seamless (including threaded couplings)			2			
IRON						
Gray Iron Castings	1					
STEEL						
Carbon Steel (including wrought iron)						
Forgings			1			
Castings				1		
Bars, CF			12			4
Bars, HR (excl. stock for projectiles, shell bodies & reinforcing bars)	18		2			
Pipe & Tubing (including threaded couplings; welded & seamless; with & without galvanized & ceramic coatings		4				1
Sheets & Strip (excl. galvanized)	365	66	18	44		6
Wire Rods, Wire, & Wire Products	184		182	2	4	
Alloy Steel (excl. stainless steels)						
Forgings	12,494		7,762	144		
Castings (excl. armor)	3	18	1			
Ingots, Billets, Blooms, Slabs, & Related Products (excl. wire rods)			93		156	
Bars, CF	3,887		11	43		2
Bars, HR	6,050	26,176	3,879	1,329	212	10
Pipe & Tubing (including threaded couplings; welded & seamless)	1,087	440	532	5	23	2
Plates (excl. rolled armor; includes plates, wide & heavy)		1,977		1	51	
Sheets & Strip	9,761	2,128	1,235	2	112	3
Wire Rods, Wire, & Wire Products		2				
Stainless Steel—Nickel Bearing						
Forgings	1,555		13	13		
Castings	30	95	6	3		
Ingots, Billets, Blooms, & Related Products (excl. wire rods)	642	806				
Bars, CF	29		1	32	1	1
Bars, HR	1,385	907	193	44	33	3
Pipe & Tubing; Welded (including threaded couplings)				14		
Pipe & Tubing, Seamless (including threaded couplings)	303	713	802	25		1
Plates				11		
Sheets & Strip	4,665	6,004	1,440	151		1
Wire Rods, Wire, & Wire Products	19		19	13		

Here's the First List

(All figures in pounds)	AIRCRAFT B52D Bomber	B58A Bomber	KC135A Tanker	F106A Fighter	MISSILES TM-76A Matador	GAR-1D Falcon
NONFERROUS METALS COPPER & COPPER BASE ALLOYS						
Brass Mill Copper Base Alloy Products						
Plates, Sheets, & Strip (excl. ammunition cups & discs)	23		10	1		2
Rods, Bars, & Wire (including extruded shapes)	1,739	200	461	7	1	5
Tubes & Pipe	9		37	1		
Brass Mill Unalloyed Copper Products						
Plates, Sheets, & Strip	89				1	
Rods, Bars, & Wire (including extruded shapes, excluding wire bars, ingot bars, or rods & wire for electrical conduction)	1	3	2		1	
Wire Mill Products (copper & copper base alloys)	1,387	318	973	178	132	1
Foundry Products (copper & copper base alloys)	108				4	3
ALUMINUM						
Forgings	11,779		9,273	15,914		
Rods & Bars, Rolled (excl. stock for wire, forgings, impact extrusions, rolled structural shapes & electrical cable)	3,596		4,446	3,800	86	6
Rods & Bars, Rolled (forging stock & impact extrusion stock)	201	13,208	347	7,787	974	
Wire & Cable (excl. rivet wire)	2	4	3			
Sand Castings	423		234	105	33	
Permanent & Semipermanent (plaster) Mold Castings	1,059		433		148	
Diecastings	32		4			
Rotor, Centrifugal, Investment & Other castings not classified	1			3		
Shapes, Extruded (excl. forging & tube stock)	53,805	9,708	25,124	2,694	558	8
Shapes, Extruded, Forging Stock	10		38			
Sheets, Strip, & Plates (including stock for forgings, pressings, & impact extrusions, excluding stock for foil)	126,143	120,414	59,208	22,920	3,669	3
Tubing	1,877		1,170	157	54	20
Honeycomb Sheets	325		494	1	202	
Powder	2		1			
Ingot		352				
MAGNESIUM						
Forgings	10		50			
Extrusions, excl. forging stock	446	37	160	16		26
Sand Castings	643		354	77		
Permanent Mold Castings	2		39			
Diecastings	16		3		31	
Sheets, Strip, & Plates	3,340	100	3,477	112	781	
MISC. BASE METALS & BASE METAL ALLOYS						
Cadmium	19		5			
Lead	20		58		8	
Tin	10					
Tungsten			283	2		
MISC. CASTING STOCKS						
Stainless Steel, nonnickel bearing	886					
Iron	1					
Alloy Steel	3	21				
Stainless Steel, nickel bearing	18	109				
Copper foundry products	1					
Aluminum	1,670		738	171		
Magnesium	4					
MISC. FORGING STOCKS						
Titanium Base		5,640		8		
Carbon Steel			2			
Alloy Steel	18,813		11,659	226		
Stainless Steel, nickel bearing	2,383			21		
Aluminum	17,057		13,910	24,777		
Magnesium	15		70			
Total Weight	**292,501**	**196,955**	**149,718**	**81,651**	**7,275**	**108**

Sources: Aircraft Industries Association & U. S. Defense Department.

Pennsy To Rent Cars

It will lease 2000 this year from ACF. Another 2000 will be purchased outright

THE PENNSYLVANIA Railroad will obtain 2000 new open hopper cars this year under an ACF Industries Inc. lease plan to provide freight cars to American railroads.

William T. Taylor, chairman of ACF Industries, said that 4000 seventy ton cars will be delivered to the Pennsy during the second and third quarters of 1959; 2000 will be purchased outright by the railroad and 2000 will be furnished under the leasing arrangement.

J. P. Morgan & Co. Inc., is collaborating with ACF in developing the plan and is the lending agent in financing the cars for the Pennsylvania lease. The cars are to be delivered under a 20 year net lease.

The plan's chief advantage to the roads, says ACF, is the freeing of cash for other purposes. The rental will be payable monthly, at a daily average "substantially below the per diem rates established by the American Association of Railroads," says ACF.

"The plan will not replace cash purchases or financing through equipment trusts and conditional sales contracts," says Mr. Taylor, but will contribute to the rails' growing need for freight cars.

Mobile Home Output High

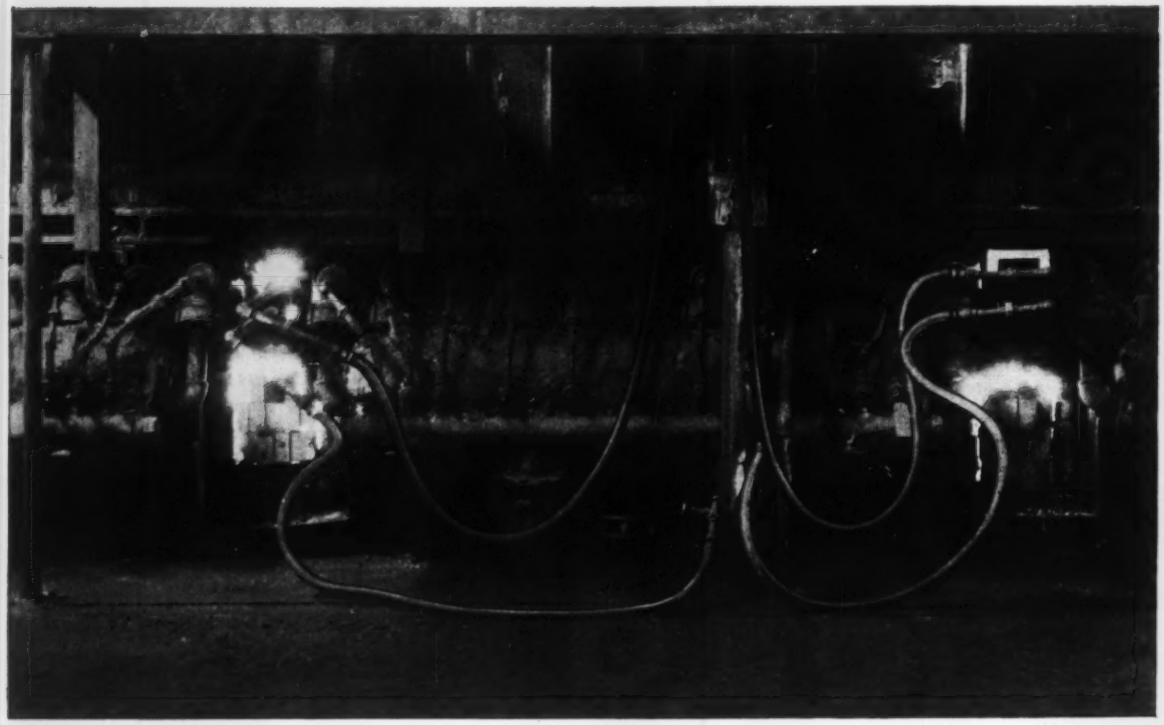
House trailer manufacturers have a yearly production capacity of about 240,000 units, says the U. S. Department of Commerce. While detailed statistics are available only through 1957, trade sources report production continues high, although there was a slight drop in 1958.

In 1957, 142 plants turned out 110,000 units. More than half the plants produce fewer than 500 annually. Five states (Ohio, Indiana, Illinois, Michigan, and Wisconsin) have 50 per cent of the business. Production is heaviest in Michigan and Indiana.

The Building Materials Division of the Business & Defense Services Administration conducted the survey to determine industry's ability to supply emergency housing in the event of a nuclear attack.

PEERLESS WATER HOSE

BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable skids and keep its pipe mill in operation. U. S. Peerless is part of the complete line of U. S. Rubber's industrial hose, engineered for use and abuse.

• • •

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'Brains' Pay Off in Detroit

Car divisions tell SAE members how they're using computers to cut paperwork costs and save scheduling time. They'll soon be giving the machines even bigger jobs to handle

THE AMOUNT of paperwork connected with even the simplest manufacturing operation in metalworking has become an awesome affair. For every ton of finished goods shipped out the rear door, it seems as though a ton of paper piles up in the form of engineering schedules, parts releases, and intradepartmental billings.

As a result of this onslaught, larger firms have turned to electronic computers to keep down indirect labor costs.

A summary of the uses for computers in the auto business was presented last week at the Society of Automotive Engineers' national production meeting in Detroit. Computers control national parts distribution for General Motors' Chevrolet Div. Ford's M-E-L Div. uses them to compile market and customer order data for manufacturing schedules. Chrysler Corp. coordinates and processes engineering and production information with them, from preliminary design to final car assembly. As these reports reveal, the electronic marvels will be doing an even bigger job for carbuilders.

Computers Plan Parts Program

Production, processing, warehousing, and distribution of 50,000 replacement and accessory parts is a major job at Chevrolet. Over 250,000 transactions are handled daily. Boyd Zacharias, Chevrolet's director of methods and controls, points out that this activity involves 42 zone warehouses to sell to dealers, 13 warehouses to handle national distribution, and four major supply depots to service these warehouses. The whole operation takes up 5 million sq ft of floor space. Recently, Chevrolet set up a new processing system designed around IBM's 705 computer. The setup eliminates most of the manual handling of inventory records and permits the information to be consolidated in a centralized record library.

• **Feedback** — Each warehouse punches out its daily transactions on a paper tape that's airmailed to the central parts headquarters in Flint, Mich. The information is recorded on magnetic tapes. As the records are processed through the central system, the computer automatically decides whether more parts must be moved from the factories or parts depots to dealers and supply warehouses.

Inventories change daily, so every day the machine recomputes warehouse requirements based on sales histories for the last four weeks. Mr. Zacharias calls this the "progressive bank" system. It allows time to replenish inventories of any given part in any warehouse before the stock is depleted. It also keeps warehouses from using costly floor space unnecessarily by overstocking. In addition to keeping warehouse stocks in balance, the computer also watches central supply depot stocks and provides information that informs purchasing agents when they should procure more parts.

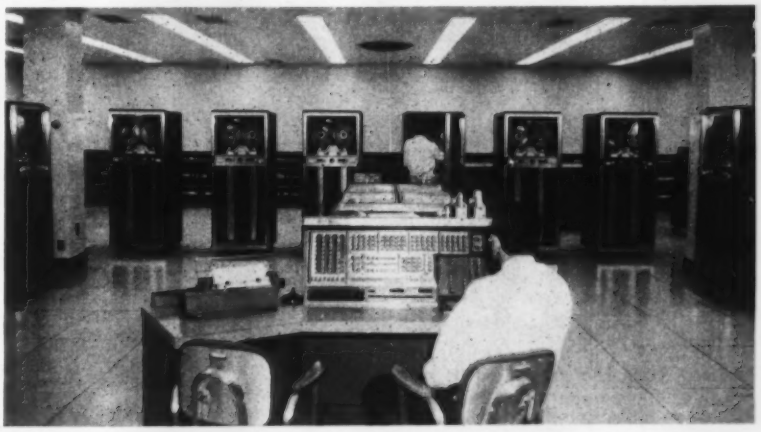
• **Programming** — Chevrolet plans to extend its computer setup in four ways: 1. To control parts reclassification and excess stock analysis. 2. To evaluate bin sizes and arrangement to more effectively utilize floor space. 3. To establish central parts billing. 4. To control procurement, distribution, and re-use of containers and parts packaging materials.

Finally, Mr. Zacharias hopes that the parts center can use its computers to determine when final lots of replacement parts should be built and how many will be needed before tooling is scrapped.

. . . Schedule Assembly Work

How many cars should a division build each month? How many will be hardtops; how many station wagons? What's the breakdown on colors, trim options, and accessory combinations? How many of each kind will be built in each divisional assembly plant? When do you send out monthly parts releases to venders? These are questions carbuilders must answer quickly and correctly if they want to operate profitably.

At Ford Motor Co.'s M-E-L Div., J. E. Zimmerman, production sched-



Here's the electronic control center for Chevrolet's national parts distribution center in Flint, Mich.

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

uling manager, explains how Mercury's manufacturing scheduling system for its four assembly plants incorporates four computer programs with a fifth program under development.

• **Step 1**—"Generally, our assembly plants have three days' vehicles in various stages of assembly on the line and each plant's production control department has two days' additional sales orders for vehicles ahead of the line," reports Mr. Zimmerman. That gives Mercury manufacturing men a five-day order backlog.

As these daily orders are received, they are key punched and sent to M-E-L's central office where computers analyze and summarize them into the 731 schedule codes Mercury adopted to describe all the various combinations of parts, accessory options, and trim. The night's summary is added to previous summaries to obtain a cumulative model year total by each schedule code for each plant. That provides an accurate weekly forecast of what each plant is going to build.

• **Step 2**—Although manufacturing has only one week's scheduled orders for "off the line" production, Mr. Zimmerman points out the department also has copies of unscheduled orders obtained from the sales department. "On cutoff dates twice a month, we analyze these copies and project this information into next month's detailed production schedule for each plant," he says. At the same time, Mercury's general sales office forwards its estimates of body mix, options, accessories, and trim for the next five months.

• **Step 3** — "Our third computer program establishes a building schedule by plant, body mix, options, accessories, and trim," says Mr. Zimmerman. The six months forward plan is based on previous computer program information, sales office estimates, and corporate decisions on over-all production.

• **Step 4** — Mercury's fourth program is the computation and preparation of parts commitments and shipment releases to venders based on the results established in Step 3. These programs are carried out twice a month, providing an automatic, bimonthly revision of schedules based on changes from customer orders.

• **Step 5** — Mr. Zimmerman adds that a fifth program is being set up to control in-plant parts inventories. It will show whether parts will be available from venders as they're needed. Planning will permit Mercury to maintain a smooth production flow without excessive buildups of parts and finished cars.

. . . Correlate Design Programs

In 1948, Chrysler Corp. issued 193,000 production releases to bring its new models to market. Last year, the company issued 350,000 releases, an 85 per cent increase. To handle this additional paperwork in less time, Chrysler has set up a central releasing and sourcing group. Engineering and production specifications for all five car lines and Dodge truck models, as well as Chrysler's marine and industrial engines, are processed through this office, which uses electronic computers.

J. J. DiCicco, director, preproduction planning and analysis, corporate manufacturing staff, points out that the first job is to compile information needed for production releases, corporate and car line materials bills, source and interchangeability catalogs.

• **Broadcast** — "As preproduction planning builds up, engineering specifications must be correlated to production specifications and sent out to different plants, divisions, and venders as quickly as possible," Mr. DiCicco explains. When sourcing is determined, these specifications are correlated on magnetic tapes. Production releases are prepared and broadcast to the entire corporation. Purchase requisitions are issued.

The releasing cycle begins about 20 months before the first car is built and continues to the end of the model run, a total of 32 months. Before Chrysler installed a computer system, most of this work was done manually. The company won't tell how much it has saved, but outsiders familiar with this type of operation estimate Chrysler's net savings at 25 to 35 per cent. The computer system will process 30.5 million characters in an 8-hour day.

• **Payoff**—Mr. DiCicco offers this example of the payoff. "Recently, a late decision was made to change the model alignment of one of our car lines. Approximately 3000 releases were involved and engineering estimated the change would take three to four weeks. By analyzing the problem in the data processing department, the necessary program was written and the corrected releases, covering 17,600 changes, were broadcast within four days. At the same time, special listings were made for purchasing and planning to cancel, cut back or add requirements for the new lineup."

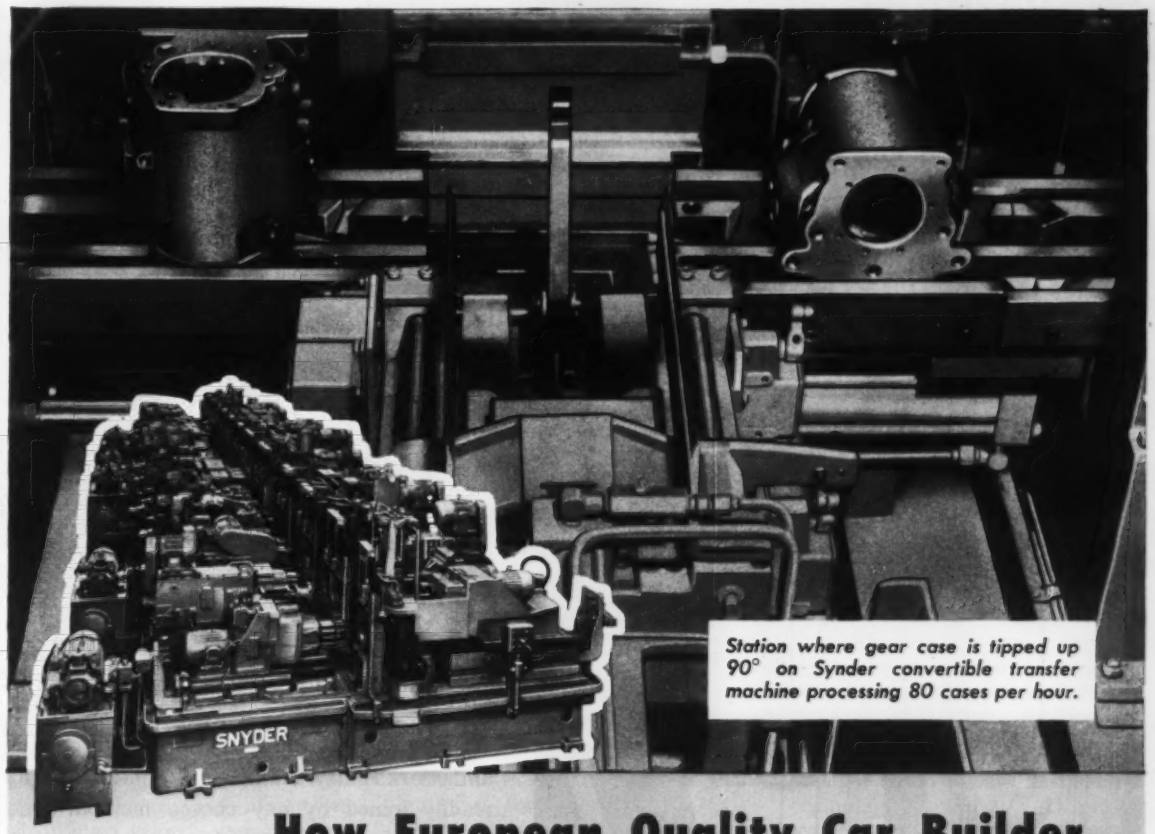
• **Future**—Chrysler now plans to install a transceiver system between its central office and outlying plants. Says Mr. DiCicco: "By using transceivers, we will be able to furnish our plants with complete specifications for the parts and cars they'll be making 8 hours after the data have been processed through source and specification analysis and central processing. The assembly plants will then be able to produce for themselves all the documents that now are generated for them by the central office computers."

U. S. Auto Output

Passenger Only	1959	1958
January	545,757	489,515
February	478,484	392,112
2 Mo. Totals	1,024,241	881,627
March		357,049
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Feb. 14	115,491	101,656
Feb. 21	120,780	89,977
Feb. 28	127,783	91,508
Mar. 7	133,540	83,892
Mar. 14	132,496†	86,447
Mar. 21	130,000*	86,589

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



Station where gear case is tipped up 90° on Synder convertible transfer machine processing 80 cases per hour.

How European Quality Car Builder Snyderizes for the Soaring Sixties

This new 53-station transfer machine combines special purpose efficiency with high convertibility for later changes. Part orienting devices enable Snyder to utilize standard horizontal way-type units to drill, spotface, chamfer, ream, line-ream, mill and bore this cast iron standard gear transmission case on all faces. The cases are turned 90° at the thirteenth station and tipped up 90° at the thirty-eighth station, which eliminates vertical machining units. The part is specifically located on faces not subject to future design changes, thus reducing future capital expenditure.

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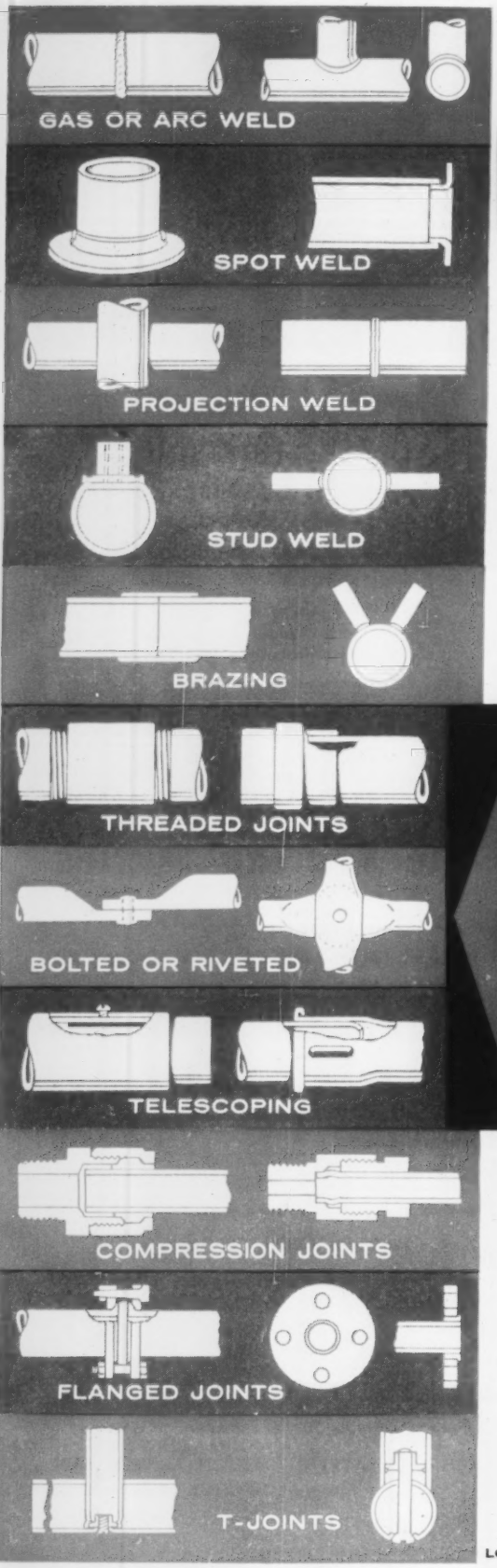

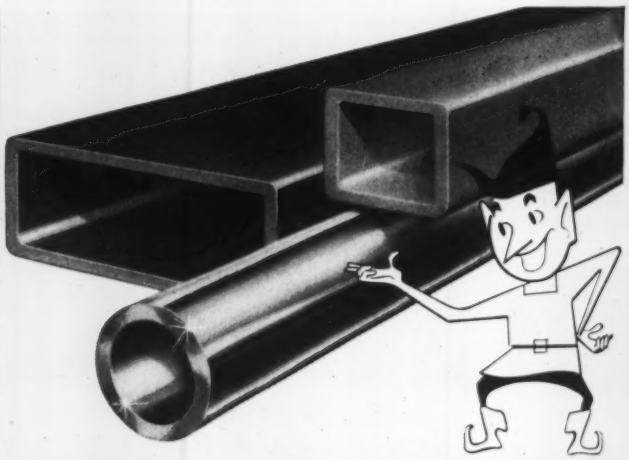

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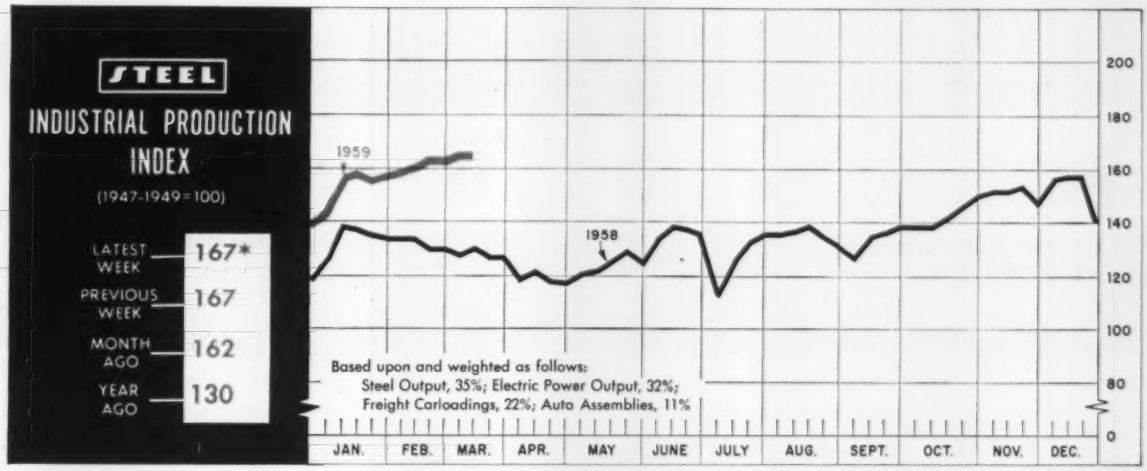

*Week ended Mar. 14.

Weekly Barometers Show Uptrend

THE STEEL INDUSTRY continues to be the big force behind the recovery, but don't sell the rest of the economy short in your analysis of business conditions. Many other weekly indicators (see Barometers of Business below) show that the uptrend is firmly established at levels well above those of 1958. In some cases, the pace is close to 1956 and 1957 levels.

But it would be easy to overestimate the strength of the uptrend because of two factors: 1. The superficial strength of steel production caused by an inventory buildup to protect against a possible steel strike. 2. Comparisons with the same periods last year, which get better as the weeks go by. The widening gap is caused as much—maybe more—by the downtrend last year as by the uptrend now.

• **Put in Perspective**—An examination of the less familiar barometers puts the economic picture in sharper focus. They show that the recovery is fairly broad in scope, but it is by no means of the boom proportions indicated by steel demand.

• **Electric Power**—Output of electricity is running about 9 or 10 per cent ahead of corresponding figures for both 1957 and 1958. Involved here is a natural growth factor which tends to throw such comparisons a little out of kilter. But the industry believes that increased industrial usage is accounting for much of today's strength.

Detroit Edison Co. reports that industrial consumption is gaining almost weekly and is 37 per cent ahead of the corresponding 1958 figures. The usual decline from January through spring is being mitigated by this resurgence.

• **Coal**—Production of bituminous coal got off to a slow start, but is beginning to pick up. Despite a setback in the week of Mar. 7 (noted in box below), output is expected to bounce back and continue at

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,610[1]	2,604	1,417
Electric Power Distributed (million kw-hr)	12,900[1]	12,945	11,860
Bituminous Coal Output (1,000 tons)	7,725[1]	8,195	8,264
Crude Oil Production (daily avg—1,000 bbl)	7,200[1]	7,213	6,257
Construction Volume (*ENR*—millions)	$372.1	$523.1	$313.1
Auto, Truck Output, U. S., Canada (*Ward's*)	166,164[1]	166,507	111,772
TRADE			
Freight Carloadings (1,000 Cars)	590[1]	596	539
Business Failures (Dun & Bradstreet)	288	296	358
Currency in Circulation (millions)[3]	$31,215	$31,126	$30,641
Dept. Store Sales (changes from year ago)[3]	+5%	+10%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,918	$25,984	$22,266
Federal Gross Debt (billions)	$285.0	$285.1	$275.7
Bond Volume, NYSE (millions)	$37.9	$40.0	$23.6
Stocks Sales, NYSE (thousands of shares)	21,187	21,018	12,007
Loans and Investments (billions)[4]	$93.8	$93.9	$88.6
U. S. Govt. Obligations Held (billions)[4]	$30.6	$30.8	$27.7
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	220.9	220.4	201.9
All Commodities[7]	119.2	119.2	119.5
Commodities Other than Farm & Foods[7]	127.6	127.6	125.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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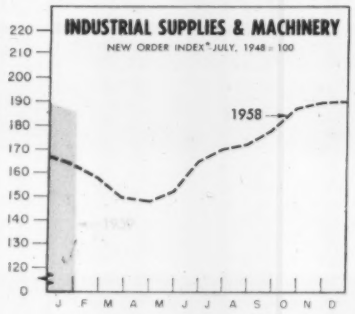
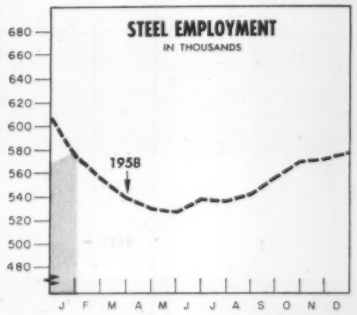
THE BUSINESS TREND





	1959	1958	1957	1956
Jan.	186	163	221	190
Feb.	...	157	219	190
Mar.	...	149	210	190
Apr.	...	148	203	195
May	...	152	199	199
June	...	164	199	197
July	...	170	197	203
Aug.	...	172	197	211
Sept.	...	178	203	203
Oct.	...	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.
Charts copyright, 1959, STEEL.

	Employment in Thousands 1959	1958	Payroll in Millions 1959	1958
Jan.	584	575	$348.0	$297.4
Feb.	...	554	....	261.7
Mar.	....	539	....	271.8
Apr.	....	529	....	259.1
May	....	527	....	270.1
June	....	538	....	278.6
July	....	536	....	280.1
Aug.	....	542	....	299.1
Sept.	....	555	....	308.1
Oct.	....	569	....	341.7
Nov.	....	571	....	320.7
Dec.	....	577	....	340.7

American Iron & Steel Institute.

about 8.2 million to 8.3 million net tons a week.

The National Coal Association anticipates production of about 450 million tons this year, which would fall halfway between 1958's 400 million and 1957's 493 million tons.

• **Oil Production**—Crude oil production has been hovering near 7.2 million barrels a day since early February. That is considerably higher than the 1958 output but somewhat below the unusually high level of 1957 following the closing of the Suez Canal.

• **Construction** — Heavy construction contract awards for the first 11 weeks of 1959 total $3.85 billion, reports *Engineering News-Record*. That's 24 per cent above the year-ago cumulative total. The weekly average is about $350 million, which is on a par with the weekly levels in 1956 and 1957.

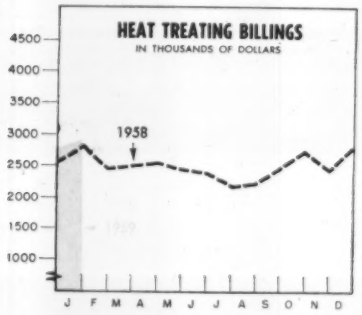
Most encouraging is the fact that industrial building contracts so far this year are 24 per cent ahead of the corresponding 1958 figure (see Page 67).

• **Autos**—For the third week in a row (the period which ended Mar. 14), over 150,000 autos and trucks rolled off motordom's assembly lines. That is on a par with production in both 1956 and 1957 at this time of the year. But in both of those years, March was preceded by considerably more vigorous automotive activity than was the case this year.

Recent cutbacks are interpreted as evidence of a downward revision in Detroit's thinking about 1959 car sales.

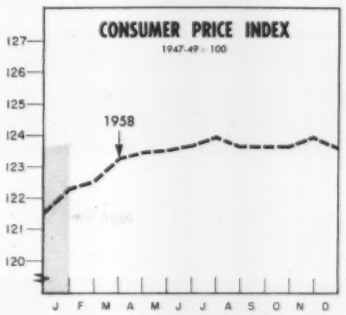
• **Freight Carloadings**—One of the best indications of the relative standing of 1959 with the three preceding years is the movement of goods. Freight carloadings are close to 590,000 cars a week. That's about 50,000 to 60,000 cars ahead of the 1958 first quarter pace but roughly 100,000 cars behind the levels of the previous two years.

The gap in the total movement of goods is not as wide as those statistics lead one to believe because of the gains which competitive transportation systems have made at the expense of the railroads. The important point is that carloadings are continuing to gain strength. They will make the big jump in late April when the Great Lakes iron ore shipping season opens (see Page 151).



	1959	1958	1957
Jan.	2,915.5	2,825.5	3,533.9
Feb.	.....	2,436.4	3,378.9
Mar.	.....	2,495.4	3,631.8
Apr.	.....	2,542.6	3,572.4
May	.....	2,421.5	3,389.6
June	.....	2,374.8	2,912.1
July	.....	2,139.6	2,767.5
Aug.	.....	2,213.0	2,830.8
Sept.	.....	2,457.1	2,765.0
Oct.	.....	2,744.9	3,076.2
Nov.	.....	2,422.0	2,677.2
Dec.	.....	2,799.4	2,579.3

Metal Treating Institute.



	1959	1958	1957
Jan.	123.8	122.3	118.2
Feb.	....	122.6	118.7
Mar.	....	123.3	118.9
Apr.	....	123.5	119.3
May	....	123.6	119.6
June	....	123.7	120.2
July	....	123.9	120.8
Aug.	....	123.7	121.0
Sept.	....	123.7	121.1
Oct.	....	123.7	121.1
Nov.	....	123.9	121.6
Dec.	....	123.7	121.6

U. S. Bureau of Labor Statistics.

• **Business Failures**—The business failure situation is the best it has been in two years. The average per week so far this year is only 286 firms, compared with a corresponding average of 311 last year and 285 in 1957. The trend has been down since the first of the year.

• **Department Store Sales**—Sales of all types of goods have been running strong since the Christmas buildup. Even the seasonal decline in January was not as severe this year as in most years. Part of the answer lies in an unusually early Easter shopping season, so many retailers are waiting until April and May before they celebrate. But sales of appliances and other household goods—not usually considered Easter presents—are holding up better than expected.

• **Nonferrous Metals**—Much of the resurgence in the basic metals industry can be attributed to copper and aluminum. Both are improving in sales, strengthening the price structure of the industry.

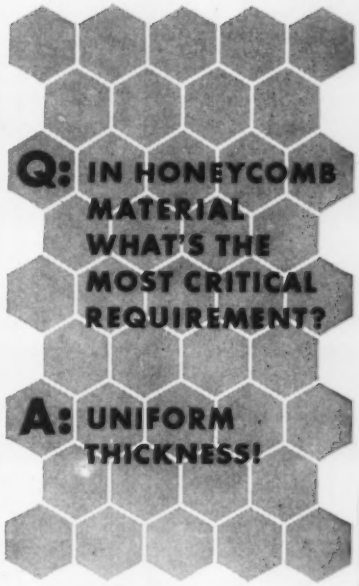
STEEL's nonferrous price index (including copper, lead, zinc, aluminum, and tin) is the highest it has been since mid-June, 1957. With the price of copper strengthening almost daily (see Page 174), it is likely to go higher soon.

Index Heads for New High

The strength of steel production is almost singlehandedly pushing this publication's industrial production index toward record heights. The preliminary reading of 167 (1947-49=100) for the week ended Mar. 14 is just 1 point shy of the all-time high. Record output of 2,619,000 net tons of steel scheduled for the week ended Mar. 22 is expected to push the trend line up to that record level.

The Federal Reserve Board's industrial production index also advanced to within striking distance of its record when it registered a seasonally adjusted 144 (1947-49=100) during February. The record of 146, set in December, 1956, was matched the next February. The increase reflected higher output in most major industries except autos.

STEEL's index, which usually forecasts the direction of the FRB indicator, shows that another rise is to be expected in the board's report for March. If the auto and steel industries finish the month at their current levels or better, the FRB index could equal its peak.



In a recent nation wide survey of honeycomb section manufacturers by an independent research organization, 75% of the responders indicated that uniform thickness of the thin metal core material was the most important factor demanded of suppliers.

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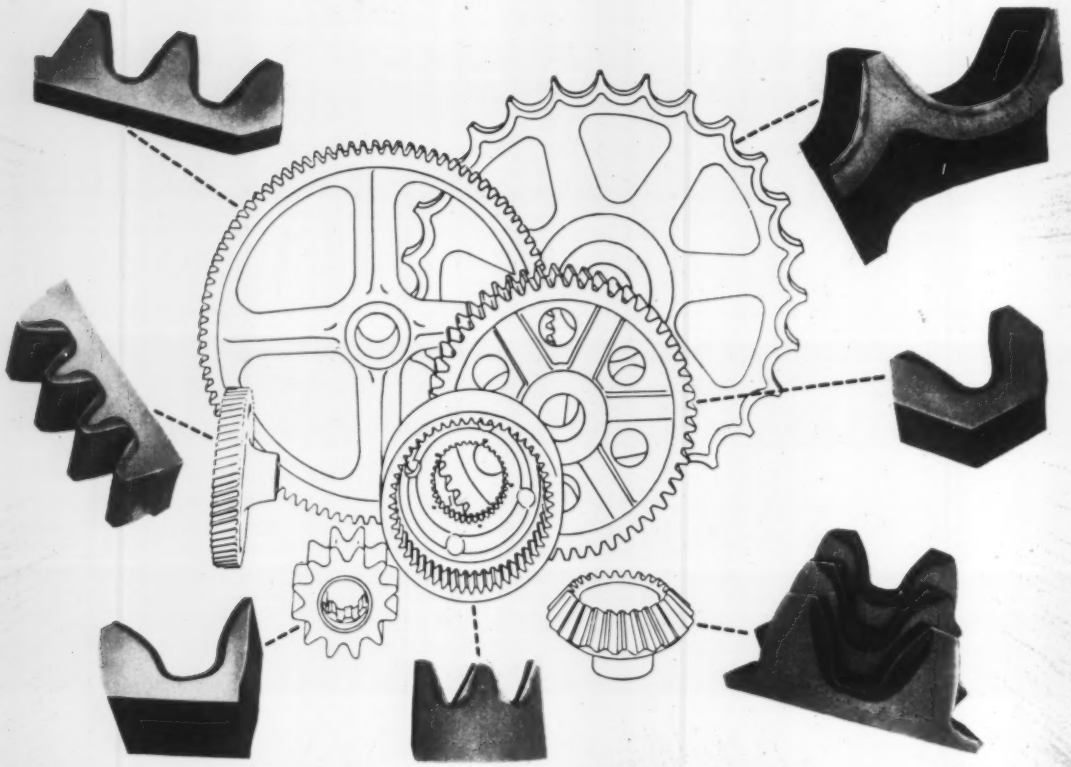
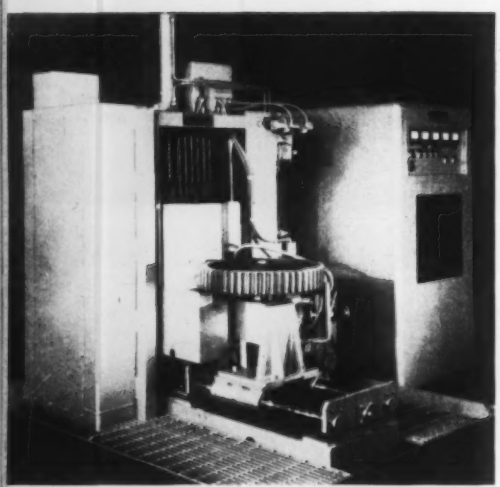


Magnethermic Induction Scanner Heat Treats 6" to 60" Diameter Gears at... SURPRISINGLY LOW COST



"Tooth—by—Tooth Gets to the Root"

This Magnethermic Induction Gear Machine scans each tooth.

All kinds of savings with this Magnethermic method . . . low power and limited initial investment. Improved physical properties, particularly in the critical root zone, in many cases allow use of smaller gears or change-over from expensive alloy steels to plain carbon grades.

Distortion minimized with only a small part of the gear heat affected; no over-all compressive forces.

Flexibility of scanning makes inductors applicable to varying face widths, machine adaptable to many gear types, plus sprockets.

With automatic indexing, attention is confined to loading and unloading . . . cumulative positioning errors are eliminated.

These advantages have been proved in actual installations.

For estimate, quotation or engineering evaluation, send prints or outline your requirements in a letter.

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CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago

FRED A. KAUFMAN
Universal-Cyclops v. p.

GLEN H. STIMSON
Greenfield Tap & Die eng.

RICHARD E. KRAFVE
Raytheon commercial v. p.

JAMES L. HARPER
City Auto Stamping v. p.

Fred A. Kaufman was appointed vice president - general manager, **Universal - Cyclops Steel Corp.**, Bridgeville, Pa. In this new post he directs sales activities and operation of plants at Bridgeville and Titusville, Pa., and Coshocton, Ohio. He was vice president-Refractomet Div.

Glen H. Stimson was appointed chief engineer, **Greenfield Tap & Die Div.**, Greenfield, Mass., United-Greenfield Corp. He was gage sales manager and chief engineer of the Gage Div. at GTD. He succeeds **Oscar E. Koehler**, retired.

Ralph Cutler was named a vice president, **Yuba Consolidated Industries Inc.**, San Francisco, and general manager, Southwest Welding & Mfg. Div., Alhambra, Calif. He was manager-estimating and engineering for Kaiser Steel Corp.'s Fabricating Div.

Edward A. Murray was appointed vice president-sales, **American Steel & Wire Div.**, Cleveland, U. S. Steel Corp. He succeeds **Harry M. Francis**, now executive vice president of the division. Mr. Murray was assistant vice president-sales.

R. E. Burton was made president and general manager, Buffalo-Springfield Div., Springfield, Ohio, **Koehring Co.**

Dr. George H. Brown succeeds **O. B. Hanson**, retired, as vice president-engineering, **Radio Corp. of America**, New York. **Jack S. Beldon** was elected vice president and general manager, home instruments.

Richard E. Krafve was elected to the new post of group vice president-commercial, **Raytheon Mfg. Co.**, Waltham, Mass. He resigned as a vice president of Ford Motor Co.

John R. Keates was elected vice president-sales, **National Automatic Tool Co. Inc.**, Richmond, Ind. He was general manager, Machine Tool Div.

Stanley B. Dowd, vice president, **Leland - Gifford Co.**, Worcester, Mass., was elected president to succeed **William F. Leland**, now chairman. **A. L. Wilkinson** was elected treasurer in addition to duties as executive vice president.

Karl L. Miller was made manager of **Buffalo Bolt Co.'s** plant in Princeton, Ill. He was assistant to the president of the parent firm, Buffalo-Eclipse Corp., concentrating on Buffalo Bolt production activities. **Thomas A. Norton** was made factory manager at Buffalo Bolt's North Tonawanda, N. Y., plant, and **Eric G. Boehm** was made general manager.

C. L. Megargle was named eastern sales manager-titanium, **Mallory-Sharon Metals Corp.**, Niles, Ohio. He was general sales manager at Tube Reducing Corp.

Frank E. Purcell was named sales manager, packaged equipment, for **Unitary Equipment Div.**, Carrier Corp., Syracuse, N. Y. He succeeds **Burton T. Kehoe**, recently made executive vice president of the subsidiary, Colorado Research Corp.

James L. Harper was elected vice president-manufacturing, **City Auto Stamping Co.**, Toledo, Ohio, division of Globe-Wernicke Industries Inc. Former plant superintendent of the Stamping Div., he succeeds **Robert Millard**, retired.

Richard L. Tannehill was elected vice president-sales, **Tube Reducing Corp.**, Wallington, N. J. He was New York district sales manager, Roots-Connersville Blower Div., Dresser Industries Inc.

Precision Tube Co. Inc., North Wales, Pa., appointed **Ivan G. Wentling** executive vice president; **Matthew F. Balch Jr.**, vice president-sales; **George W. Swint**, vice president-plant operations.

Raymond E. Mack Jr. was named sales manager, **Fawick Airflex Div.**, Fawick Corp., Cleveland.

Milton A. Karrer, works manager, was promoted to vice president-manufacturing, **Crucible Steel Casting Co.**, Milwaukee.

Fred A. Sabacek was elected president, **Reproduction Products Co.**, Detroit, subsidiary of General Aniline & Film Corp. He succeeds **Thomas Kizer**, resigned.

W. Gifford Myers was elected corporate vice president-sales, **Lockheed Aircraft Corp.**, Burbank, Calif.

James W. Nelson Jr. was named general manager, X-Ray Dept., Milwaukee, **General Electric Co.** He succeeds **Dr. Lyman R. Fink**, recently promoted to general manager,

J. F. BAIER
McKee v. p.-Metals Div.

WILLIAM J. VALL
Hydreco mgr.-quality control

WALTER L. TREADWELL
indus. eng. mgr. at Paceco

MERLE L. GRUVER
Kaiser Steel plant supt.

Atomic Products Div. Mr. Nelson was manager of GE's microwave laboratory at Palo Alto, Calif.

J. F. Baier was elected vice president-engineering, Metals Div., **Arthur G. McKee & Co.**, Cleveland. **A. L. Foell**, vice president, who was in charge of both engineering and consulting in the division, now devotes his time to new developments and processes within the metals industry, as well as directing consulting services.

William J. Vall was appointed manager of quality control and traffic, **Hydreco Div.**, Kalamazoo, Mich., New York Air Brake Co. **Dallas Betzer**, assistant purchasing manager for Hydreco, succeeds Mr. Vall as manager-purchasing and traffic.

Vincent Barreca was named executive vice president, **Admiral Corp.**, Chicago, to succeed **John B. Huarisa**, resigned. **Thomas J. Lloyd** was named vice president-government electronics. **L. H. Moos** was named president of Midwest Mfg. Corp.; and **Stuart D. Brownlee** president of Canadian Admiral Corp. Ltd., both subsidiaries.

Albert J. Weinburger was made industrial relations manager, **Gulf States Tube Corp.**, Rosenberg, Tex., subsidiary of Michigan Seamless Tube Co.

George W. Cross was elected vice president - operations, **Mid - States Welder Mfg. Co.**, Chicago. **Otto E. Fenske Jr.** was elected vice president-sales.

Raymond L. Howerton was named sales manager, **Cascade Mfg. Co.**, Portland, Oreg.

Walter L. Treadwell was made industrial engineering manager, **Pacific Coast Engineering Co.**, Alameda, Calif. He is in charge of planning and scheduling production, methods, and cost controls. He was assistant chief engineer.

A. J. Tomasek, president, **Walsh Refractories Corp.**, St. Louis, was also named chief executive officer and chairman to succeed **P. L. Hershfield**, effective Apr. 1.

Kenneth O. Grant was appointed director of the purchasing office of **Ford Motor Co. of Canada Ltd.**, Toronto, Ont. He was general purchasing agent at the Oakville, Ont., assembly plant.

Hunter E. Pickens was made industrial relations manager, Indianapolis plant, **Ford Motor Co.** He succeeds **H. M. Bash**, resigned.

Robert H. Matthies was made industrial relations manager for the Santa Barbara and Montebello, Calif., divisions of **Western Design**, a division of U. S. Industries Inc. He is in Montebello.

Robert W. Likins was made division superintendent, industrial relations, at **Kaiser Steel Corp.'s** Fontana, Calif., plant.

John F. Miles was appointed assistant to the general superintendent, Dominion Iron & Steel Div., **Dominion Steel & Coal Corp. Ltd.**, Montreal, Que. He was assistant superintendent of Dosco's Blast Furnace Dept. at Sydney, N. S.

Richard E. Sutherland was made sales manager, **S-P Mfg. Corp.**, Solon, Ohio.

Merle L. Gruver was appointed superintendent of the soaking pits, blooming mill, slabbing mill, and structural mill at **Kaiser Steel Co.'s** Fontana, Calif., plant.

Hooker Chemical Corp., Niagara Falls, N. Y., appointed for its Eastern Chemical Div.: **John S. Coey** sales manager; **Robert F. Schultz**, production manager. The chief marketing executive of the division, Mr. Coey also continues as a vice president of the corporation. **Charles Y. Cain** was made assistant sales manager; **Charles W. Selover**, manager of purchases. This recently formed Eastern Chemical Div. includes plants at Niagara Falls, Montague, Mich., and Columbus, Miss. In the Phosphorus Div., Jeffersonville, Ind., **Robert E. Noble** was made assistant general manger; **Barrett B. Brown**, production manager.

C. C. Shearer, effective Apr. 1, succeeds **Jim Withington** as Cleveland district sales manager, **Bohn Aluminum & Brass Corp.** Mr. Shearer is production manager, Detroit plant.

Thomas Bannon was promoted from chief engineer to director of production engineering for **Clearing Div.**, U. S. Industries Inc., Chicago. **John Cameron** was made assistant chief engineer-technical services.

Richard L. Bishop was made Houston branch manager, **Acme Industries Inc.**

William H. Stewart was made Pittsburgh district manager, Electrical Wire Div., **John A. Roebling's Sons Corp.**, subsidiary of Colorado Fuel & Iron Corp. **Thomas A. Martino** was made Cleveland district sales

IF YOU WANT COMPLETE SAFETY IN YOUR SAFETY SWITCHES— REMEMBER THE "V" FOR VISIBLE BLADES!

The men who pull the switches will tell you what can happen when a switch, *believed* to be open—*isn't.* A lot of things can happen—and every one of them is bad. Personnel safety is in jeopardy. Motors can single-phase. Machinery and work can be damaged. Down-time can skyrocket.

Doesn't it make sense to insist on Visible Blade construction which gives you a road block against any of those possibilities? Doesn't it make equally good sense to insist on the safety switch which gives you that construction—plus a lot of other performance advantages?

NEW! TYPE LD SWITCH

Quality Features at Low Price

- ✓ Spring-operated quick-make, quick-break
- ✓ Box lugs. Easy to wire No looping
- ✓ Compact enclosure, yet lots of wiring space
- ✓ Positive pressure (spring loaded) fuse clips
- ✓ Full horsepower ratings

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

JOSEPH STATSINGER
Servo director-engineering

DR. HAROLD L. GARBARINO
joins Magnaflux Corp.

HAROLD W. NELSON
Great Lakes-Carbon Div. post

L. B. POLEN
Allegheny Ludlum foundry post

MELVIN B. MONSON
Ryerson plant gen. mgr.

CHARLES S. HEGEL
Ryerson plant gen. mgr.

manager, Electrical Wire & Cable Div.

L. B. Polen, former Buffalo plant manager, was appointed manager of manufacturing, Forging & Castings Div., **Allegheny Ludlum Steel Corp.** He directs production operations of division plants at Buffalo and Ferndale, Mich.

C. D. Thompson was made regional sales manager, Chicago, Metal Products Div., **Goodyear Tire & Rubber Co.** **R. O. Bowersox** was named manager-wheel sales for the division.

R. A. Jones was named sales manager, molecular sieves, **Linde Co.**, New York, division of Union Carbide Corp.

Kenneth R. Bragg joined **Parker Aircraft Co.**, Los Angeles, as chief systems engineer.

John S. McMullan was made purchasing agent, Gear & Machine Div., Sanford, N. C., **Saco-Lowell Shops.** He succeeds **W. H. Kinard**, retired.

Melvin B. Monson was named general manager, Los Angeles plant, for **Joseph T. Ryerson & Son Inc.** He succeeds the late **Wayne D. Dukette.** **Charles S. Hegel** succeeds Mr. Monson as general manager, Milwaukee plant. He was national product manager for stainless steel, and is replaced by **H. Daniel Robb**, former national product manager for alloy steel. **Edward J. Richardson**, in addition to duties as national product manager, tubing, and cold finished bars, assumes Mr. Robb's former responsibility.

Arch Miller Jr. was named assistant general superintendent, **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp. He is succeeded by **George E. Hugus** as manager, Tin Mill Dept. Mr. Miller succeeds **G. W. Gould**, named general superintendent of the new Midwest Steel Corp. plant which National Steel will build in the Chicago metropolitan area.

Quentin Keeny joined **Dust Suppression & Engineering Co.**, Lake Orion, Mich., as sales manager.

Joseph Statsinger joined **Servo Corp. of America**, New Hyde Park, N. Y., as director of engineering. He was assistant chief engineer in charge of missile guidance at Arma Div., American Bosch Arma Corp.

Dr. Harold L. Garbarino joined **Magnaflux Corp.**, Chicago, as chief engineer-electronics. He was with Armour Research Foundation, Illinois Institute of Technology.

Harold W. Nelson was made technical director of **Great Lakes Carbon Corp.'s** Carbon Div. Former manager of research in the Research & Development Dept., he remains at the company's research center in Morton Grove, Ill.

Reynolds O. Tjensvold was made manager, Labor Relations Dept., **Inland Steel Products Co.**, Milwaukee. He held a similar post with Kearney & Trecker Corp.

Federal Pacific Electric Co., Newark, N. J., named new marketing managers: **Gordon E. Benson** moves to Scranton, Pa., as marketing manager for the Eastern Switchgear Div. He is replaced as marketing manager-General Products Dept. by **Harry W. Ashman.** **Leopold Van Blerkom** joined the company as marketing manager - Instrument Dept. He was project manager, Industrial Div., Daystrom Inc. **Richard S. Smithley** was made marketing manager-relays.

Raymond S. Livingstone fills the new post of vice president, human relations, on the corporate staff of **Thompson Ramo Wooldridge Inc.**, Cleveland. He served in a similar capacity for Thompson Products Inc. prior to its merger in October with Ramo-Wooldridge Corp. **Arch T. Colwell** fills the new post of vice president-engineering, research, and development.

Jay Kaplan was elected vice president, **M. S. Kaplan Co.**, Chicago. He will direct expansion of its Non-Ferrous Metal Dept.

Dr. Arthur R. Matheson was made manager, reprocessing, at **Sylvania-Corning Nuclear Corp.'s** Bayside, N. Y., facility.

Reginald B. Beam was made industrial district manager, Chicago, for **Joseph Dixon Crucible Co.** He succeeds **Emory Bleam**, retired.

3 GREAT NEW Motoblox®

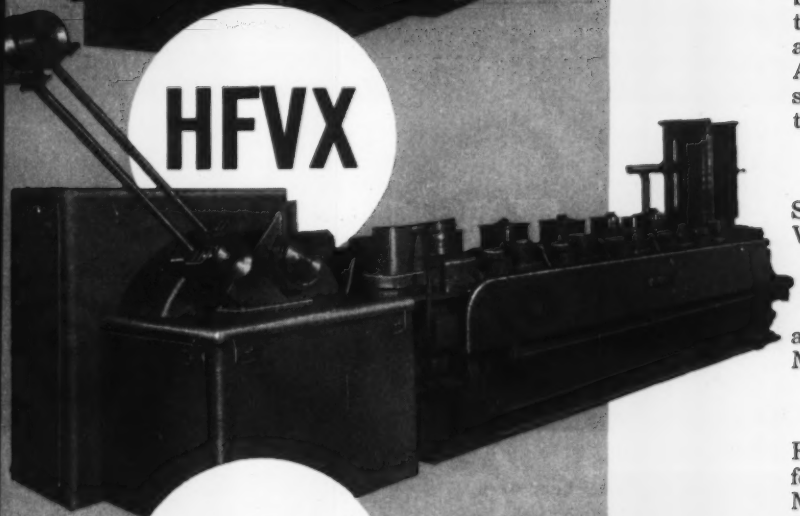
engineered for today's demands

by Vaughn®

HRK

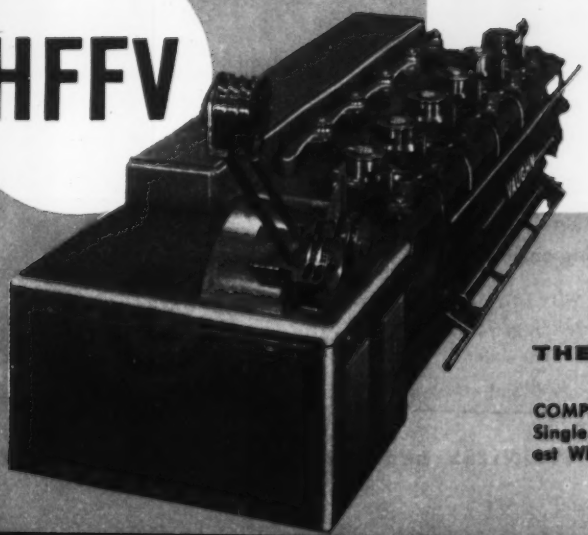
Exceptionally effective cooling on the Vaughn HRK Motoblox is provided by water circulating in the interior of the 27″ diameter intermediate blocks, augmented by an external blast of air. Ample wire storage is assured by offsetting the individual block units on this "straight-through" rod machine.

HFVX



Superseding a previous model, the Vaughn HFVX Motoblox is the ideal machine for drawing the smaller sizes of alloy and high carbon steels. Speed, cooling, flexibility, and safety are effectively combined in this modern Motoblox.

HFFV



For those still finer sizes that are preferably drawn *dry*, the Vaughn HFFV Motoblox is the answer! Sizes ranging from .025″ diameter and finer may be finished on this 8″ diameter block version of the Motoblox, with or without spooler.

"Quick on the Draw!"

THE VAUGHN MACHINERY COMPANY

Cuyahoga Falls, Ohio, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT . . . Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

SERVICE
IN STAINLESS STEEL

"FLIGHT OF PROGRESS"
a stainless steel sculpture by Robert Edward Hamilton

In the past 12 months 91% of all orders for J&L stainless steel bars were shipped, *at least* in part, within 24 hours.

That's service!

The key to such service is a simple one: Complete and balanced inventories at the Mill *and* at strategically located Service Centers only hours from *your* plant or warehouse.

With the most modern flat rolling facilities in the industry now in operation at Louisville, Ohio, J&L is now giving the same service on flat rolled products that fabricators and warehouses have been getting on J&L bars and wire.

Whether you need stainless sheet, strip, bar or wire for your production line or your warehouse customers, *you can get it faster from J&L.*

Plants and Service Centers:
Los Angeles • Kenilworth (N. J.) • Youngstown • Louisville (Ohio) • Indianapolis • Detroit

J&L
STAINLESS
SHEET • STRIP • BAR • WIRE

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34

Casting Institute Promotes Research

A CO-OPERATIVE research program has been developed by the Investment Casting Institute, Chicago. Each member company contributes one project. In return, it receives a completed study from each of the other members.

A central ICI research committee, in co-operation with members, has drawn a list of projects of concern to manufacturers. Institute members select one of the recommended topics or propose other areas.

Each company prepares a proposal for the project it will undertake. All proposals are reviewed by the committee to co-ordinate the program. Affiliate members, suppliers to the industry, are encouraged to participate.

Three reports have been submitted since the venture was started last November: "Properties of AISI 410," by W. F. Carn and "The Effect of Die Temperature and Wax Temperature and Pressure on Cavitation in Wax Patterns," by Irving Malkin, Precision Metalsmiths Inc., Cleveland; "The Effect of Aging Time and Temperature on the Mechanical Properties of Investment Cast 17-4 PH," by F. K. Iverson, Cannon-Muskegon Corp., Muskegon, Mich.

Bliss Buys Into Gamewell

E. W. Bliss Co., Canton, Ohio, has purchased 30 per cent of the outstanding common stock of Gamewell Co., Newton, Mass. Bliss makes metalworking presses and rolling mills. Gamewell produces fire alarm telegraph systems.

Testing Facility Opens

Propulsion Test Facilities Inc., affiliate of MB Mfg. Co., a division of Textron Inc., New Haven, Conn., has been organized. It will offer environmental test facilities for aircraft and missiles. George Mettler is president.

Linde Builds Oxygen Plant

Linde Co., a division of Union Carbide Corp., New York, will construct a liquid oxygen and nitrogen producing plant near Huntsville, Ala. It will serve the southern aircraft, missile, steel, chemical, petroleum, and food industries. Capacity: 100 million cu ft of oxygen and nitrogen per month. The plant is scheduled for completion early in 1960.

Crane Co. Drops Line

Crane Co., Chicago, is quitting the manufacture of malleable and cast iron fittings.

CF&I Modernizes Wickwire

Colorado Fuel & Iron Corp. will spend $1 million for new equipment and modernization of its Wickwire Spencer Steel Div., Tonawanda, N. Y. Installation of a galvanizing unit and revamping of a 450 ton blast furnace are included in the program.

Turner Brass Renamed

Turner Corp. is the new name adopted by Turner Brass Works, Sycamore, Ill. Product diversification made the old name obsolete. The firm makes propane and gasoline torches, lanterns, stoves, tubular plumbing goods, furniture trim, and diesel engine starting aids.

Jobbing Division Set Up

A jobbing division has been established by Fort Pitt Bridge Works, Pittsburgh. It will allow the company to handle lighter and more diversified structural steel fabrication and specialty work. Ralph E. Arnold is manager.

NEW OFFICES

Cambridge Wire Cloth Co., Cambridge, Md., opened a sales and service office at 4627 Wornall Rd., Kansas City, Mo., under the direction of A. J. Lutz.

Harvey Aluminum, Torrance, Calif., moved its San Diego, Calif., engineering offices to larger quarters at 426 Olive St. Charles Hayes is district sales manager.

National Cylinder Gas Div., Chemetron Corp., New York, opened branch offices at 2045 Meeting St., Charleston Heights, S. C., and 2191 S. Green Rd., Cleveland, Ohio. The division also maintains district sales offices and facilities for the manufacture of oxygen, nitrogen, and acetylene at 1151 E. 222nd St., Cleveland, Ohio.

ASSOCIATIONS

Can Manufacturers Institute, Washington, has elected Roger F. Hepenstal, American Can Co., New York, president, succeeding William J. Milton, George A. Milton Can Co., Brooklyn, N. Y. Reuben L. Perin, Continental Can Co., Mt. Vernon, Ohio, was elected vice president.

Association of Steel Distributors Inc., New York, has elected the following officers: Gilbert Merrill, Gilbert Merrill Steel Corp., Mineola, N. Y., president; Walter Ising, Laube Steel Co., Chicago, vice president; Saul Bradburd, Interstate Iron & Supply Co., Philadelphia, vice president; Jack Jacobs, Jacobs Metal Sales Ltd., Rexdale, Ont., secretary; Arnold J. Hanson, Amay Steel Co., New York, treasurer.

American Foundrymen's Society, Des Plaines, Ill., has authorized the board of trustees of the AFS Training & Research Institute to complete specifications for erection of a new institute building. It will be on the present society headquarters site. The action is subject to board approval of contract bids.

Institute of Scrap Iron & Steel Inc., Washington, has appointed I. D. Shapiro, United Iron & Metal Co. Inc., Baltimore, as co-ordinator of dealer activities.

Tire & Rim Association Inc. has elected as president J. J. Robson, director of tire engineering and development, Firestone Tire & Rubber Co., Akron, succeeding Paul G. Hykes, Budd Co., Detroit.

Material Handling Institute Inc. has appointed Robert F. Moody, sales manager, Domestic Industrial Truck Div., Hyster Co., Danville, Ill., as chairman of the expositions committee.

forging a renaissance in COPPER

THE BETTMANN ARCHIVE

Forging "new metals" has been routine procedure at Wyman-Gordon for 75 years. Contrasting the modern marvels of metallurgical development is the oldest metal employed by man—copper. Here you see the largest copper closed die forging ever produced—a Re-entry Shield weighing 1875 pounds (67-1/2" x 21-1/2"). Unexcelled know-how, with the availability of the most modern forging equipment, assures the ultimate in forging quality to meet the constantly expanding demands of progress—man's quest for greater speeds and power in his unending exploration farther and farther into yesterday's unknown.

WYMAN-GORDON COMPANY

Established 1883

FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM
Also Beryllium • Molybdenum • Columbium and other uncommon materials

WORCESTER 1, MASSACHUSETTS
HARVEY, ILLINOIS • DETROIT, MICHIGAN

HAFNIUM RECTIFIERS— Hafnium will significantly increase the efficiency of tomorrow's rectifiers, says A. O. Smith Corp., Milwaukee. This type power supply has been gaining ever since germanium was first used for such purposes. (Copper oxide came first, followed by selenium, germanium, and silicon.)

ALUMINUM FOR HOT JOBS—An experimental aluminum alloy, X2219-T6, exhibits tensile strength superior to that of conventional aluminum alloys at 600° F. After 100 hours at temperature, the alloy showed 20,000 psi tensile strength, 15,000 psi yield strength, and 25 per cent elongation. Stress rupture and fatigue properties were good in the 500 to 600° F range. Extrusions made of the alloy, which contains copper, manganese, and small quantities of vanadium and zirconium, also showed high resistance to stress corrosion cracking.

TRANSISTOR SUPREMACY THREATENED— A thimble-size electronic receiver tube developed by Radio Corp. of America may put the electron tube on a competitive basis with transistors. Called the Nuvistor, the glassless tube uses simplified parts and stronger materials such as tungsten and molybdenum. RCA says Nuvistor tubes are more versatile than transistors because they handle wider ranges in voltage, frequency, and temperature. Now in the advanced development stage, the tubes will probably be used first in television sets.

NEW TOOL FOR METAL RESEARCH—Better control of metal structures and properties may be the outcome of a new ultrasonic tool that generates a frequency of 10,000 megacycles. Developed at General Electric Research Laboratory, Schenectady, N. Y., the tool may open the way for new discoveries in solid-stage research. By shaking up the atoms in the metal, the ultrasonic energy will allow researchers to investigate such things as the energy levels of atoms and the interactions of electron spins in a crystal lattice. The 10,000 megacycles sound waves are created by applying microwave pulses to a quartz crystal in a special cavity-resonator device. The crystal must be held at about −456° F to keep the ultrasonic vibrations from degenerating into vibrations associated with the heat content of the material.

CAUSE OF TITANIUM EMBRITTLEMENT— Beta embrittlement, the loss of ductility which limits forgeability of some high strength titanium alloys, is caused by a large beta-grain size obtained during heat treatment, says an Air Force sponsored report. Heat treatment alone is ineffective in restoring ductility to the beta-embrittled material. Certain alloys, such as Ti-16V-2.5 Al, show a relatively low rate of beta grain growth. Development of alloys with this property is recommended as the best way to avoid or minimize beta embrittlement effects.

CUSTOM LUBRICATION— A new technique based on the interpretation of mass spectrometer data will lead to more exact knowledge of lubricants through molecular arrangements. Relating performance to molecular structure will enable scientists to predict exactly how well a synthesized petroleum composition will react under unusual conditions, says Gulf Oil Corp.

STRONGER ZINC DIE ALLOY—A new high strength zinc-base alloy, called Formaloy, exhibits superior properties as a die material for forming sheet metal, says its producer, American Smelting & Refining Co., New York. Useful for drop hammer punches and dies, draw press dies, stretch press dies, and similar tooling, the material has an average impact strength of 37.2 ft-lb. It is readily workable, and no special casting or machine techniques are required for fabrication.

GRAPHITE MOVES AHEAD— Two developments demonstrate the increasing versatility of this element: A new high temperature graphite shows low wear and low friction at 1200° F, says Stackpole Carbon Co., St. Marys, Pa. A special form of the material is being woven into a flexible cloth by National Carbon Co., a division of Union Carbide Corp., New York.

POWDER IS PRESSED to desired shape, sintered, then forged to the right density to make large x-ray targets. Seamless tubing is made by hot extrusion. Forging is made by upsetting a rod, then hot forming it by steps

Breakthrough in Tungsten Fabrication Promises Wider Use of Pure Metal

Refractory properties make it desirable for many applications, but it's hard to work; now, with new techniques, it can be forged, extruded, deep drawn, or spun

HAVE an application in your plant for a high density metal that keeps its strength at high temperatures?

Tungsten may be what you're looking for. It has the highest melting point of all the refractory metals, and the right density for radiation shielding.

It's easier to form now, thanks to techniques developed in the last year at the Metals & Fabrication Div., Fansteel Metallurgical Corp., North Chicago, Ill. R. W. Yancey, consulting metallurgist, reports that the metal can be forged, extruded, deep drawn, or spun.

• **Forming Methods**—It has to be worked at temperatures where other metals would melt. It must be formed rapidly. As it nears 800° F, the metal loses ductility and shrinks. If it surrounds the forming tool, there's a tendency to fracture. Tools must have strength at high temperatures and must be wear resistant.

Ductility increases after preliminary working. Forgings, made in a series of operations, include rivets, x-ray tube targets, rocket nozzle throats, and electron tube parts. Some large parts are made by pressing tungsten powder to the desired shape, sintering it, then forging to the right density.

Seamless tubing is made by hot extrusion, reducing the area of the billet end by 70 per cent. It may be possible to draw the extruded tubing, producing thinner walls, or to upset it, making special shapes. It could be sliced to make flywheels for self-winding watches, electrical contacts, vacuum tube components, or small gyroscope rotors.

A significant breakthrough in fabrication is the spinning of rolled plates or sheets. Until recently, spinning was confined to soft, ductile metals. The method is expected to find use in making rocket nozzles, or re-entry nose cones.

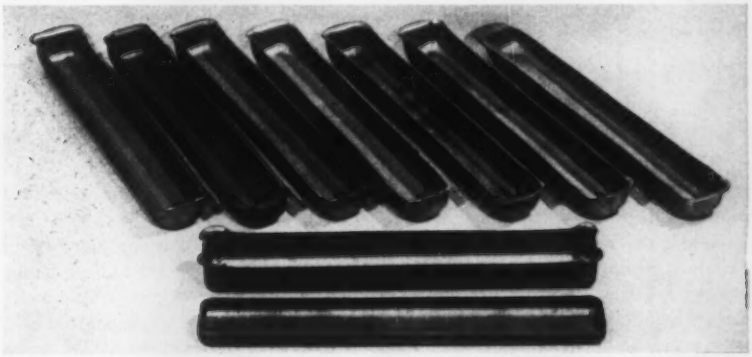
• **Deep Drawing** — Until a few months ago, the metal had not been deep drawn, Mr. Yancey says. The process will make a wide variety of parts. Example: Tungsten boats, or trays, will permit the firing of small vacuum tube parts at higher

PARTS MADE BY SPINNING SHEETS may lead to better rocket designs. The metal can withstand temperatures developed as missiles re-enter the atmosphere

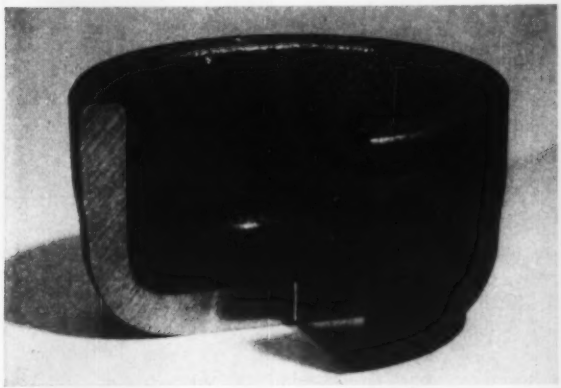
temperatures. That will improve the quality of the tubes.

Gyroscope rotors can be made by drawing and machining tungsten. The pure metal has 20 per cent greater density than alloys now used. It would permit rotors to be smaller, without loss of reliability. Because the metal shows less thermal expansion than any now used in rotors, it would improve gyroscope performance.

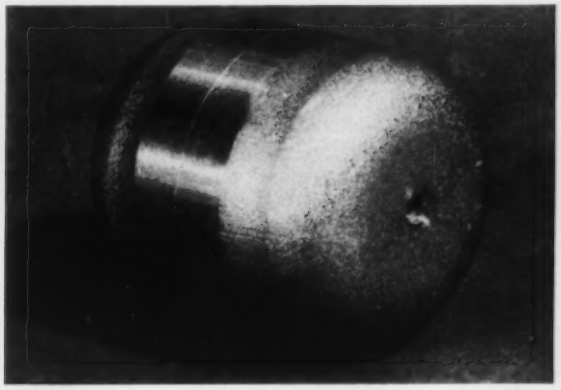
In another application, two drawn tungsten cups were brazed with gold, forming a suitable container for radioisotopes. It could be used as a casing for a miniature atomic powerplant.



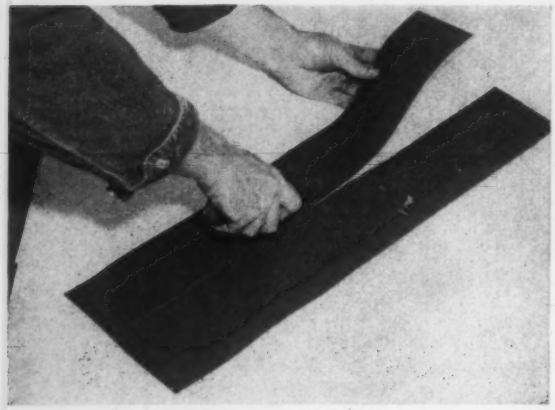
DEEP DRAWN BOATS permit firing of small vacuum tube parts at higher temperatures, improving tube quality. Boats can also be used in metal vapor deposition equipment. The metal has been deep drawn only in the last year



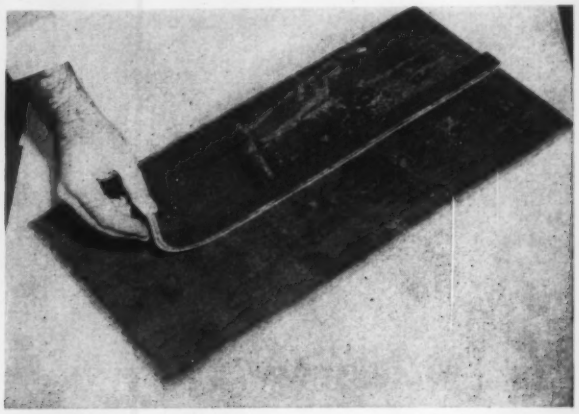
SECTION OF CUP, drawn from a 0.170 in. plate, shows a radius smaller than metal thickness. The metal, formed at high temperatures, loses ductility at about 800° F



CONTAINER FOR RADIOACTIVE MATERIALS is made by brazing two deep drawn cups with gold. Tungsten has higher density than lead; it's useful for radiation shielding



ONE—Operator cuts the Du Pont explosive with a linoleum knife. Outline follows the shape of the cut, in this case, a straight line. Rubber table top prevents sparking



TWO—Both explosive and metal are coated with an adhesive and joined. Intimate contact is necessary for maximum efficiency. Explosive handles like limp linoleum

Do It Yourself: Explosive Cutting

First reports indicate this new method can be applied to a wide variety of materials. It may not replace oxyacetylene method, but it's great for special jobs

IF you are stymied by a cutting job, try explosives.

A new technique has been worked out by E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. It's simple to use, inexpensive, and, provided certain conditions are met, some firms can use it in their own backyards.

• **How To Do It**—The first step is to slice a piece of Du Pont's EL-506A high explosive to the shape of the cut you want to make. (It takes a 1 in. strip to cut ½ in. steel, or 8 grams of explosive per square inch.) A straight line takes a strip, and a circle requires a doughnut, for example. The explosive is flexible and resembles sheet rubber. You cut it with a linoleum knife on a nonsparking surface like a rubber covered table top.

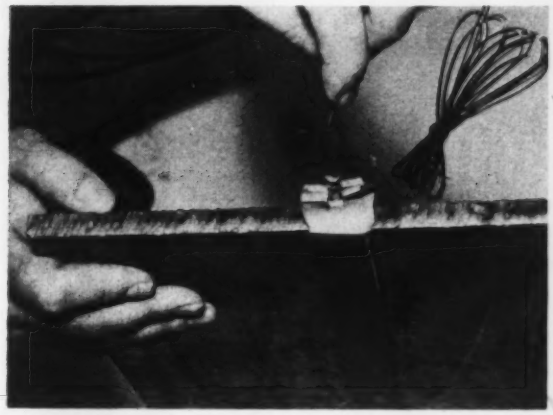
The area on the metal to be cut and the explosive are brushed with an adhesive. After the explosive is glued to the part, a blasting cap is applied.

• **Detonation**—The prepared part is placed on hard flat ground or submerged in a pool of water. As soon as the charge has exploded, you can pick up the separated parts.

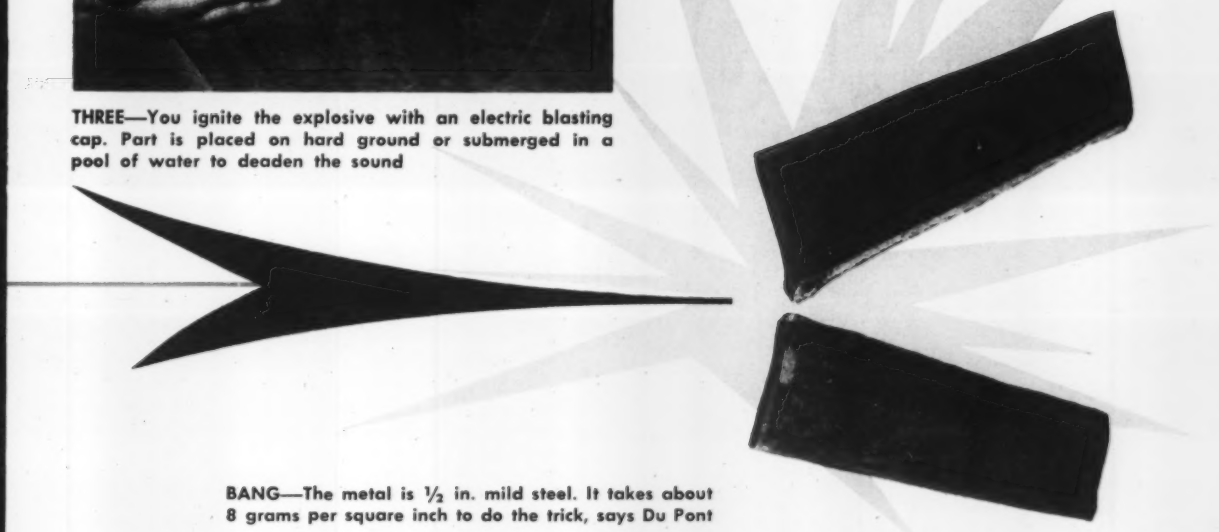
Several techniques enable you to cut fairly thick metal. A flat strip of explosive will handle an ordinary piece of metal, but heavier sections require a concentrator. (The plate illustrated at right is 1 in. thick.) A simple angle iron bent 60 to 90 degrees or a piece of pipe works fine.

• **Precautions**—Du Pont points out that its method is backed up by plenty of research and experience, but those who use the technique need proper training. Another factor: Installations have to be in harmony with state or local laws governing the use and storage of explosives.

Once you take care of the precautions you'll find this new sheet explosive is reasonably safe to handle. For example:



THREE—You ignite the explosive with an electric blasting cap. Part is placed on hard ground or submerged in a pool of water to deaden the sound



BANG—The metal is ½ in. mild steel. It takes about 8 grams per square inch to do the trick, says Du Pont

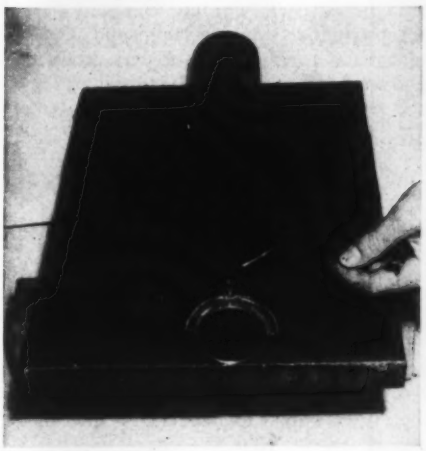
It won't explode if you drop an 18 lb steel ball 10 ft onto a piece lying on a steel plate.

It won't explode if you fire a 30 caliber bullet into it from 15 yards.

It won't explode if you throw it into a wood fire.

• **Limitations**—One disadvantage is that cuts are shaggy and require some cleaning up. But it's perfectly plausible, Du Pont says, to improve the application to the point where cleaner and more accurate cuts can be made. A possible approach: Shearing with an explosive-actuated cutter backed up by heavy metal edging.

Experts aren't predicting that the system will replace the oxyacetylene cutting torch. But the field is wide open if you'd like to give it a try.



Thicker pieces require a shaping device to concentrate the blast for penetration. A piece of pipe or angle iron will do

You can cut a lot of different shapes. Hhere's how a circle is cut with a doughnut shaped piece of high explosive. Edges are a little ragged, but technique is quick and easy.

STEEL Announces the 2nd Annual

COST CRISIS

The Challenge

The cost crisis is metalworking's most critical, continuing challenge. As pressures drive product costs higher, resistance to price increases gets stiffer.

Importance of Materials

Today, particularly with the advent of automation, the portion of costs allotted to materials is on the increase. In some plants, material costs already account for more than half the total cost of a product. Materials are prime targets for cost cutting.

Are You Beating the Cost Crisis?

Perhaps your company has found a way to trim unit product costs through more efficient use of materials. If so, your success can win national recognition for you, your cost-cutting team, and your company.

Search Is On

STEEL's editors are launching their second Cost Crisis Awards Competition to focus attention on the need for intelligent cost cutting (via materials) and to show readers how it's being done. The best entries will be published in STEEL.

Awards for Top Ten

A panel of metalworking managers, representing a cross section of the industry, will select the ten best entries.

Production Efficiency Awards will be presented to the president of each winning company for encouraging production, engineering, and purchasing supervisors to find ways to cut product costs through more efficient use of materials.

You Qualify for an Award

If you are a full-time employee of a metal producing or metalworking plant . . .

If you participated in the cost saving project . . .

If your project was completed after Jan. 1, 1953.

Send for Your Kit Today . . .

It'll simplify the preparation of your entry. It contains a set of helpful questions and a folder for mailing your entry to us. Here are the questions:

1. **WHAT WAS THE COST PROBLEM?** (Tell what product is being made, what materials are involved in

AWARDS

Competition

To find new ways to lower unit product costs through more efficient use of materials

the cost cutting, and explain the costs that were out of line—were they purchasing, inventory, production costs? Other? How was the problem discovered?)

2. WHAT WAS THE SOLUTION AND HOW DID YOU FIND IT? (Who proposed it—management, purchasing, engineering, production? Briefly describe the steps you took in analyzing the problem and determining the solution. Explain why your solution was accepted over any others considered.)

3. WHERE WAS COST CUTTING ACHIEVED? (Did you reduce the price of purchased material? Did your solution prune manufacturing or inventory costs or simplify procedures? Explain how the cost solution benefited your company.)

4. WHAT ARE THE "BEFORE" AND "AFTER" UNIT COSTS? (Tell how the improvement in material use affected over-all product cost, or how it affected the costs of parts or operations. Give dollar figures if possible.)

Material Cost Cutting

Four areas of material utilization will be explored. Your entry may apply to one or a combination of them:

1. The substitution of a tailored shape for standard mill products, or vice versa.

Example—

Dana Corp., Toledo, Ohio, amassed an 8 per cent saving on transmission mainshafts and output clutch shafts by switching from bar stock to die-formed shapes made by Republic Steel Corp.'s Bolt & Nut Div., Cleveland.

2. The use of a standard purchased material instead of a special, or vice versa.

Example—

Hoover Co., North Canton, Ohio, used to buy close tolerance strip steel for vacuum cleaner tops. A switch to 19-in. coiled sheet saves 12 to 14 cents a unit.

3. Standardization of two or more separate purchases into one.

Example—

National Acme Co., Cleveland, now specifies AISI 4615 for all steel parts to be carburized; three different alloys used to be purchased for the same jobs. Also, one alloy, 4350, has replaced three others on a number of jobs. Advantages: Purchasing and inventory costs were cut about 10 per cent.

4. Direct substitution of one alloy for another of the same basic material.

Example—

International Products & Mfg. Co., Chicago, trimmed rejects 10 to 15 per cent and reduced machining time 20 per cent when it switched from heat treated 4140 and 8640 steels to La Salle Steel Co.'s Fatigue-Proof steel bars for generator and starter shafts.

For your Cost Crisis Awards Kit, write:

Cost Crisis Editor
STEEL
PENTON BUILDING
CLEVELAND 13, OHIO

Turn the page for the 1958 Winners of Production Efficiency Awards

Introducing the Winners

in STEEL's 1958 Cost Crisis Awards Competition

Here are the two winners in each of five plant groups. A distinguished panel of metalworking managers selected them on this basis: They did the most effective job of reducing unit production costs through more efficient use of capital equipment

Plants Employing Fewer than 100

Pioneer Industries Inc., Sioux City, Iowa
L. F. Kohl, General Superintendent
Relayout of the production line and some new equipment enabled this company to save $85,000 a year and trim the price of its liquefied petroleum gas tanks nearly 18 per cent (STEEL, July 28, 1958).

Radiation Counter Laboratories Inc., Skokie, Ill.
Vernon Brown, Plant Manager
Manhours saved in punching holes in electronic chassis repaid a $10,000 investment in the first year. The change: A hand indexed punch was replaced with a Wales-Strippit fabricator-duplicator (STEEL, July 21, 1958).

Plants Employing 100 to 249

General Foundry & Mfg. Co., Flint, Mich.
W. Arthur Coakes, Plant Engineer
Engineers came up with a touch of automation, then integrated it into their cupola charging facilities. Results: Direct labor costs dropped 41 cents on every ton of iron melted; product quality improved, and a $27,550 investment was recovered in three years (STEEL, Dec. 1, 1958).

Technicraft Laboratories Inc., Thomaston, Conn.
Robert W. Witty, Production Engineering Supervisor
New tooling for a Warner & Swasey turret lathe helped cut the price of microwave flanges to a more competitive range. A reduction in operations (from six to three) trimmed part costs 35 per cent (STEEL, Sept. 15, 1958).

Plants Employing 250 to 499

Studebaker-Packard Corp. (Foundry), South Bend, Ind.
G. T. Costas, Foundry Manager
It used to take seven men to cast jacket and barrel cores for V-8 engines. Now it requires only two. Relayout of the production department, plus some new equipment, slashed costs from $171.78 to $49.08 a day (STEEL, Oct. 20, 1958).

Cambridge Wire Cloth Co., Cambridge, Md.
Henry Murphy, Plant Engineer
A transfer system automatically moves crimped wires to a weaving machine, and a new loom feed boosts weaving speed. Results: Direct labor charges dropped 50 per cent; line productivity went up about 75 per cent (STEEL, Dec. 29, 1958).

Plants Employing 500 to 999

Electric Steel Foundry Co., Portland, Oreg.
Jack B. Sieforth, Work Simplification Co-ordinator
A six-point attack on casting inspection costs produced an estimated productivity gain worth $103,815.12 a year. Total investment in the program: About $5750 (STEEL, Dec. 8, 1958).

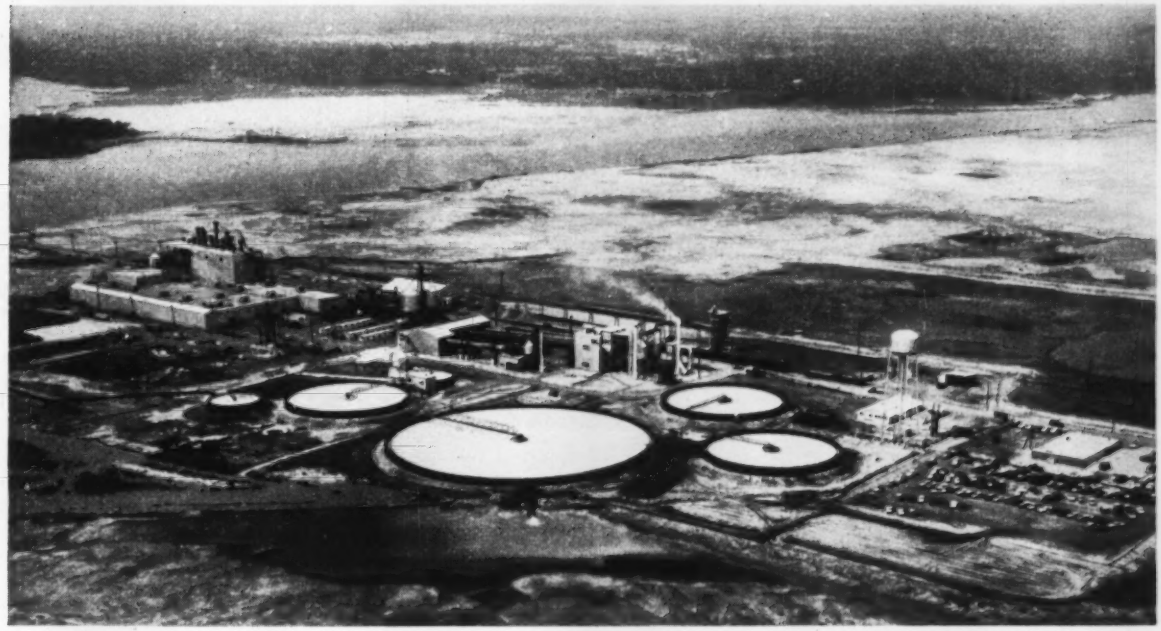
Reliance Electric & Engineering Co., Control Div., Cleveland
William J. Nemeth, Methods Engineer
With a new 40-ton Wiedemann turret press, Reliance is saving $2252.68 a month in panel production. Direct labor has been reduced 78 per cent on some parts (STEEL, Aug. 11, 1958).

Plants Employing 1000 or More

Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
William J. Doerr, Assistant Factory Manager, Motor Div.
Three equipment changes save $17,589 a month in syncrohousing production. First, automatic size compensation was added to a centerless grinder. Second, a Wisconsin special automatic boosted production rates 500 per cent on four jobs. Third, a double-spindle Heald Bore-Matic boosted production 367 per cent (STEEL, Oct. 27, 1958).

Eaton Mfg. Co., Axle Div., Cleveland
Robert E. Wilbert, Methods Supervisor, Industrial Engineering Dept.
Differential side pinions have to be finish ground on the bore and a radius. The job used to be done one operation at a time. Eaton engineers designed and built a transfer system that links the bore grinders to radius grinders. Saved: $38,436 a year (STEEL, July 14, 1958).

Now! Porter goes basic! The first in the south, this new basic refractories plant at Pascagoula went "on stream" **during February**



Porter's new $12 million Pascagoula Works is a sea-water periclase and basic brick facility using the finest in modern equipment in a fully integrated production unit.

Southern industry will soon begin benefiting from faster deliveries and lower freight rates on all forms of basic refractories from H. K. Porter's new Pascagoula Works on the Gulf Coast. Inland waterways, too, will allow easy access to America's industrial heartland.

Products of this new works—Porter's 15th refractories plant—will include burned, chemically bonded, plated and plain brick, mortars, castables, plastics and ramming mixes of chrome and periclase compositions. A unique double-burning process employed in producing Porter periclase grain insures basic refractory products of the highest quality.

Annual output of this new plant indicates an ample, dependable source of supply. Equally important, Porter engineers and ceramists provide the complete customer service that is rapidly becoming recognized as a Porter principle.

For information on shipments, prices, or *any* refractories problem, write *Pascagoula Works, Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

PORTER BASIC REFRACTORY PRODUCTS

BASIC REFRACTORY BRICK
(burned and chemically bonded in both metal clad and plain categories)

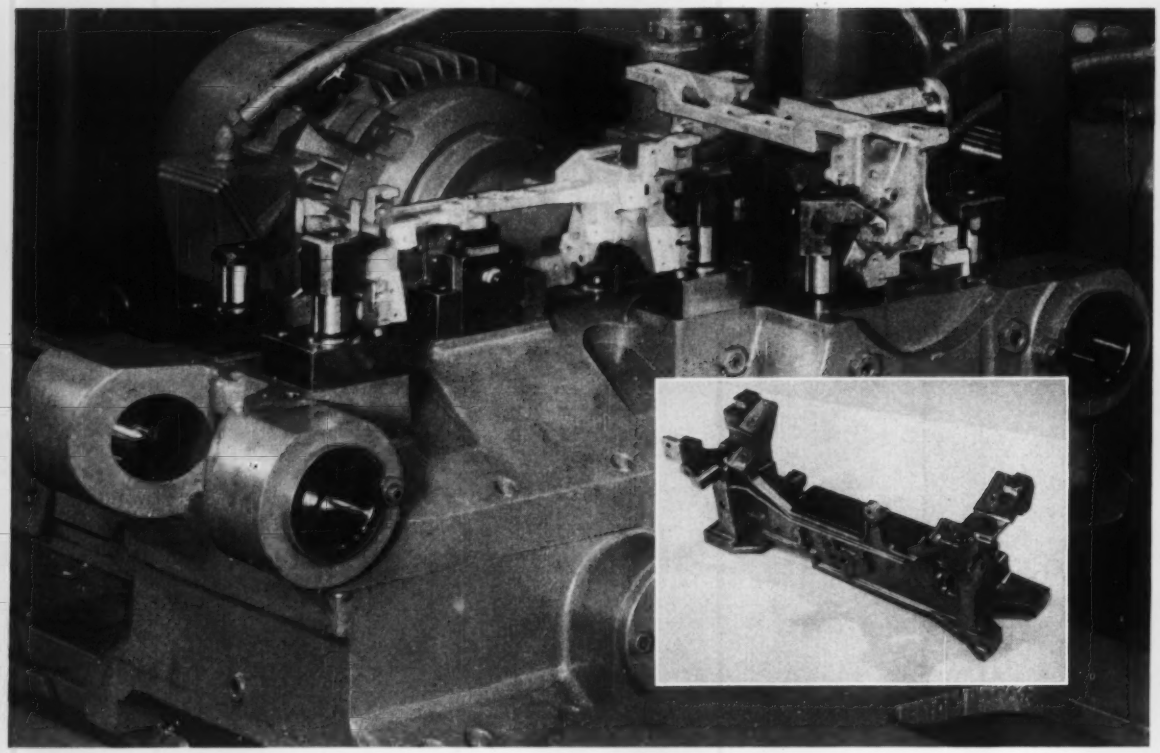
CM-30	Chrome Magnesite
CM-40	Chrome Magnesite (Roof Brick)
MC-70	Magnesite Chrome
Kilmag	Magnesite Chrome (for rotary kilns, offered in burned and plated only)
M-90	Periclase

BASIC REFRACTORY SPECIALTIES

Kromtite	Chrome Air-Set Mortar
Plastikrom	Plastic Chrome Ore
Kromor	Ground Chrome Ore
Kromform	Chrome Castable
Subhearth Kromform	Chrome Castable
Airkrom-C	Coarse Chrome Gun Mix
Airkrom-F	Fine Chrome Gun Mix
Magnaram 85	Periclase Ramming Mix, 85% MgO
Magnaram 95	Periclase Ramming Mix, 95% MgO
Peritite	Periclase Air-Set Mortar

REFRACTORIES DIVISION **PORTER** ***H.K. PORTER COMPANY, INC.***

DIVISIONS: Connors Steel, Delta-Star Electric, Disston, Forge & Fittings, Leschen Wire Rope, Mouldings, National Electric, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.



The fixture uses a kid-glove touch as this aluminum diecasting cycles through 105 operations

Delicate Parts Can Be Moved on Transfer Machine

Lack of rigidity in the workpiece is nearly always a problem in machining. The problem is compounded when the part has to be transferred mechanically

AN automated transfer line is turning out aluminum diecast power frames for typewriters at the rate of 150 an hour at 100 per cent efficiency.

Designed and built at Cross Co., Detroit, the pallet type Transfermatic does 105 broaching, milling, drilling, reaming, spotfacing, chamfering, and tapping operations on each delicate part.

• **Problems**—The power frame presented serious problems to fixture designers because of its inherent flimsiness. With former methods, cost per piece was high; and scrap losses were substantial.

A number of tolerances are close. The carriage support rail seats are maintained in plane within 0.001 in.; over-all length must come within 0.003.; the shaft holes are in-line from end to end within 0.001 in.; the hole locations relative to milled surfaces must be within 0.003.; and the four broached spring seats are held in plane to 0.005 in.

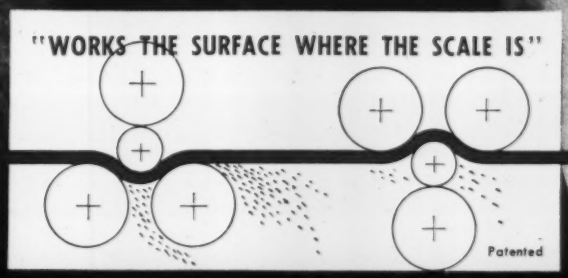
• **Answers**—Parts are processed in two position pallets with power clamping fixtures. Each part goes twice from the loading station through the ten machining stations. On the first trip, the part is processed with the top, bottom, and back side exposed to machine units. The second time around, the part is clamped with the ends exposed.

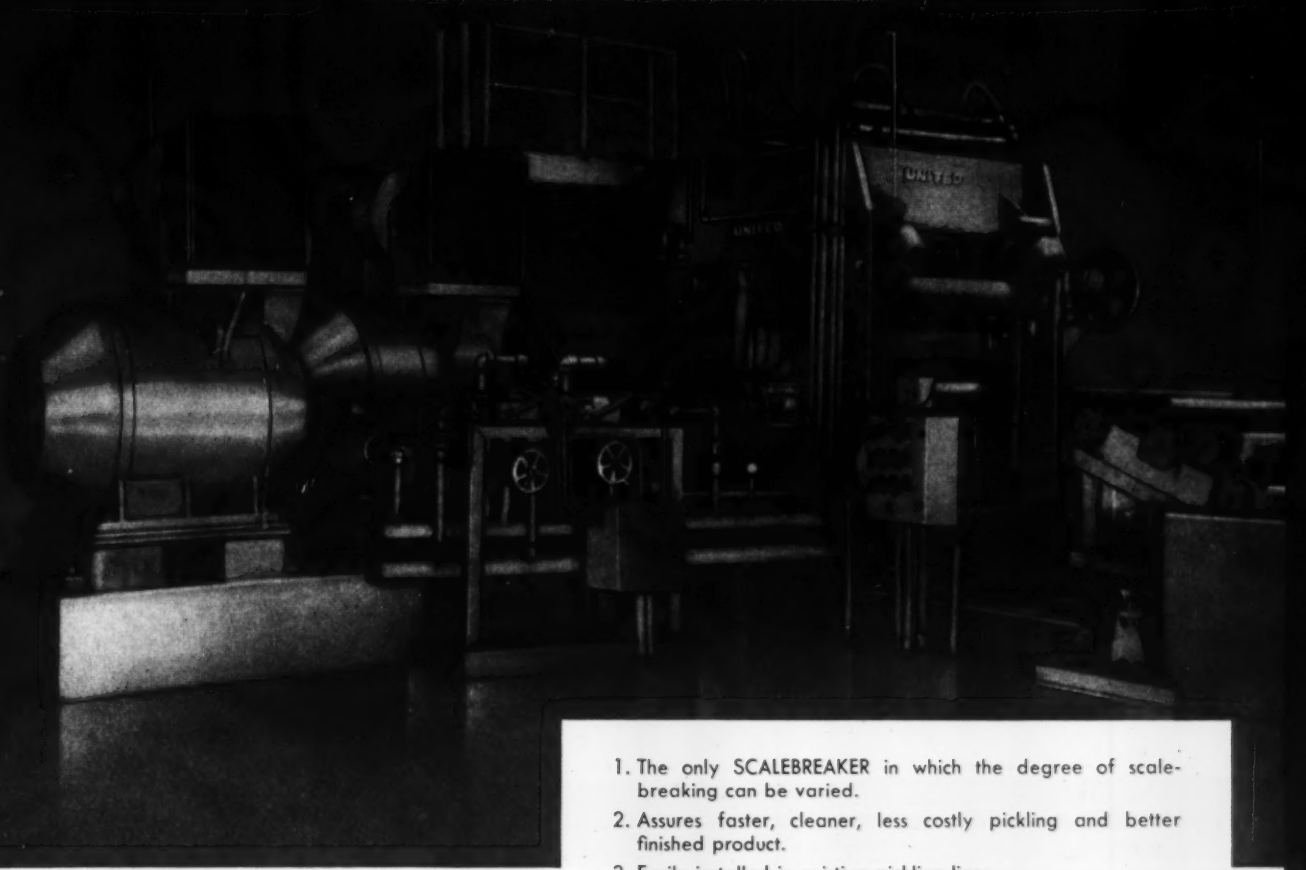
The slightest overclamping results in part distortion, so frames are held in the pallet fixture by spring loaded clamps, each adjusted for exact spring tension. In the first position, the part is centered on a fixed pin that locates in a cast hole in the part, and it's located on four points on the part. In the second position, the part is centered again by the cast hole, and it is located from four stepped rail seats that were milled during the first trip through the machine.

To further reduce the distortion and deflection of the part during machining, high cutting speeds and fine feeds are used to lower the cutting pressures. The combination also generated improved surface finishes.

UNITED

NEW *Strip Processing* SCALEBREAKER





1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

Write today for complete engineering data.

UNITED ENGINEERING AND FOUNDRY COMPANY

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Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

This is a Crack . . . it cost $10,000

You can't see this crack. Neither could the sharpest eyed inspector, without an effective test system. Yet this tiny crack was big enough to cause parts rejection later, that stopped production. Unfortunately, this only happened after an estimated $10,000 had been wasted in useless finishing operations on the parts containing this crack.

Cracks like this and similar defects develop in all metal parts—under practically any fabrication or processing method. Simple economics make it too costly to gamble, when you can find these imperfections *before* they cost you money and disrupt manufacturing schedules.

If you would prevent such waste, Magnaflux offers you the most complete variety of highly developed nondestructive test systems.

They include:
Magnaflux-Magnaglo to test magnetic metals . . .
Zyglo for nonmagnetic and other materials . . .
Sonizon Ultrasonic Testing . . .
Stresscoat to find and measure stress areas . . .
Magnatest electronic testing for hardness, conductivity, cracks, etc. . . .
And many others

One or another of these Magnaflux Test Systems can improve and simplify your testing. Prices start at $36.00, to save you money—and increase the productivity of your men and machines.

Ask to have your Magnaflux Engineer show you how . . . and *how easily*. As your nationwide "House of Answers" for testing, we maintain an extensive list of technical literature. Write and tell us of your problems or inspection aims. We'll send you facts and data most closely relating to your individual needs.

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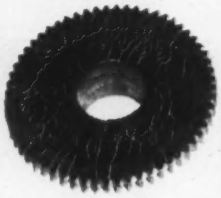
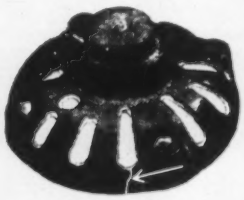
THE HALLMARK OF *Quality* IN NONDESTRUCTIVE TEST SYSTEMS

Cracks have many causes — find the cause and you'll spotlight the cure — early



Grinding cracks as seen with Magnaglo. In this case the result of wrong wheel.



Handling cracks in a grey iron casting, as shown by Magnaglo. Here caused by rough handling between pouring and machining.

Nonferrous inclusions found with Magnaglo in a forged part after rough machining. No time lost in finishing.

Shrink cracks in copper billet, sharply revealed by Zyglo, prevented rolling into defective bars.

Grinding cracks in carbide tool. Detection by Zyglo avoided failure in use.

Lacquer Protects As It Lubricates

IF YOUR metal forming process requires a lubricant, there's a new lacquer that may fill your needs and give you a corrosion protection bonus.

Called Trilac, it is one of a series of adhesive resin products being marketed under that brand name for protection of ferrous and nonferrous metals.

The lacquer recommended as a lubricant can be used for forming, drawing, stamping, or pressing operations on steel, nickel alloys, copper, aluminum, or magnesium. Surfaces are protected from marring and die life may be increased.

Other lacquers in the series gasify cleanly and permit annealing or welding without removal of the coating. One is suitable for coating springs or metal parts and cures during the annealing process.

Both permanent and temporary types can be dissolved in nonflammable, rapid drying trichloroethylene. All may be applied by dipping, flow coating, spraying, or brushing.

Trilac is a development of Imperial Chemical Industries Ltd., England, and is being introduced in the U. S. by Chemical Mfg. Co., New York, and Arnold, Hoffman & Co. Inc., Providence, R. I., a subsidiary of Imperial Chemical.

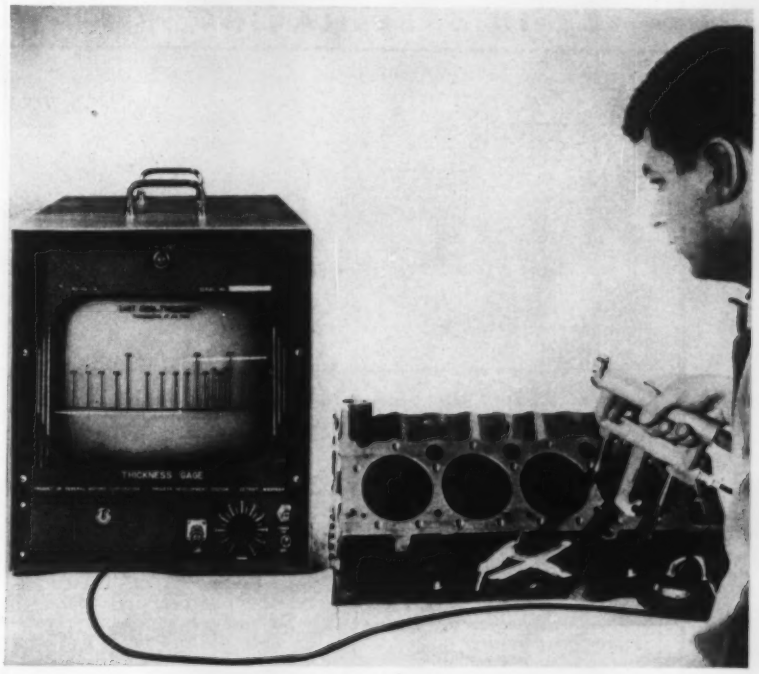
New Coolant Increases Turret Lathe Output

A new water diluted cutting fluid has boosted turret lathe output almost threefold for a large machine shop in the Chicago area.

The shop machines forgings for missile guidance systems. Parts (4140 steel) are 6 in. in diameter and 8 in. long.

Previously, operators made rough and finish cuts and produced about 28 finished pieces per day. The new coolant, (Hocut 237, E. F. Houghton & Co., Philadelphia) eliminated the rough cut and raised output to 80 pieces.

More benefits: Lathe speeds and feeds have been increased (spindle speed has been doubled) and tool life has been etended up to 2½ times.



Resonance frequency probe is inserted in the cylinder. At some frequency point (up to 4 million cps), the probe and the wall surface are in resonance. This varies with wall thickness and produces the reading

Gage Simplified for Better Quality Control

Quest at General Motors leads to new ultrasonic device to measure cylinder wall thicknesses. Tester can be used for ferrous and nonferrous metals, glass, and plastics

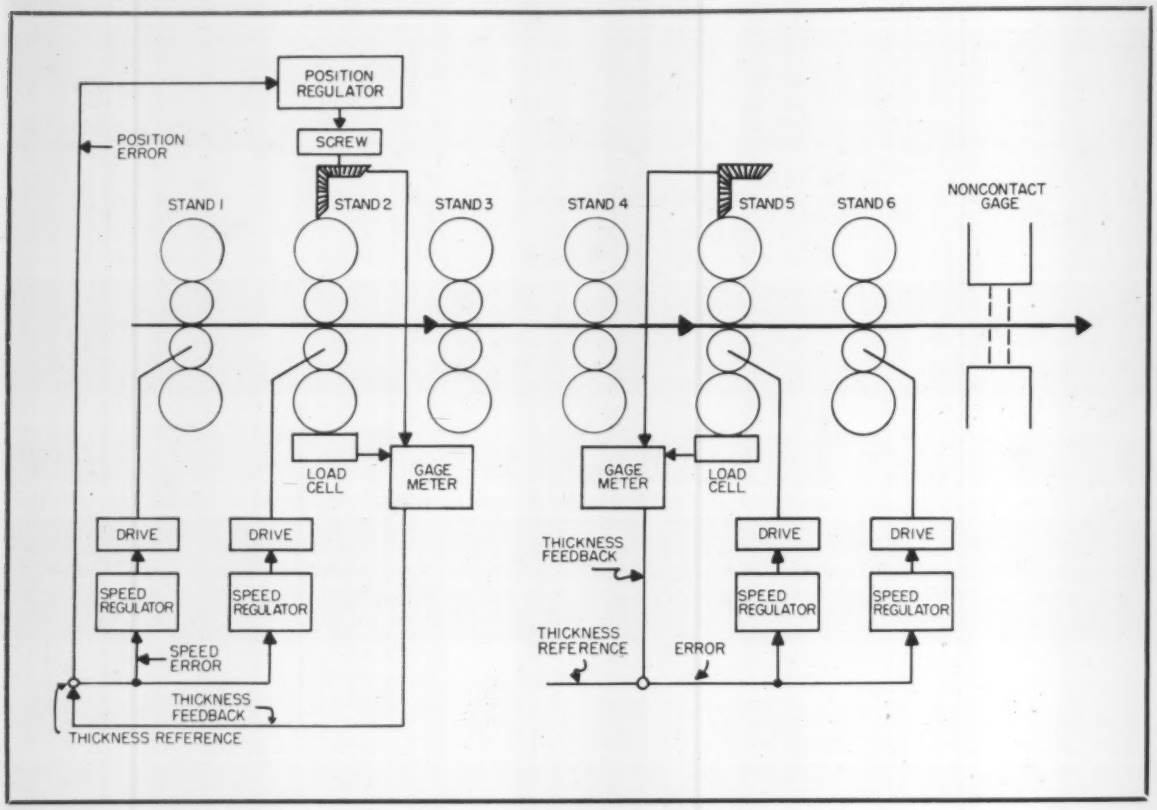
DOES YOUR quality control program hinge on measuring wall thickness when only one side of the material is accessible? If so, take a tip on gage simplification from the process development staff of General Motors Corp., Detroit.

Upon request of one of GM's divisions, the staff developed an easy-to-read ultrasonic gage that simplified measuring minute variations in cylinder wall thickness.

• **New Gage**—A specially trained operator is not required. Wall thickness is shown as a vertical step in a horizontal line on the 14 in. oscilloscope screen rather than by two or more vertical "pips" which might call for expert interpretation.

When wall thickness is down, a red light flashes on. The light may also be replaced by other devices for automatically marking or segregating substandard parts.

• **Adaptable** — The nondestructive tester can also be adapted to measure thickness of straight or curved surfaces of cast iron, steel, aluminum, magnesium, brass, lead, glass, and most solid plastics.



This is General Electric's idea of a gage meter control system for a 6 stand, hot strip mill. In proposed plan, an electronic brain is tied into the feedback system

Experts Say Automatic Mill Is in Sight

Today's pushbutton and manually operated rolling mills are prime targets for full automation with computers to adjust rolling variables for maximum output and quality

A NEW ERA in steelmaking is about to begin: Mill automation aided or controlled by digital computers.

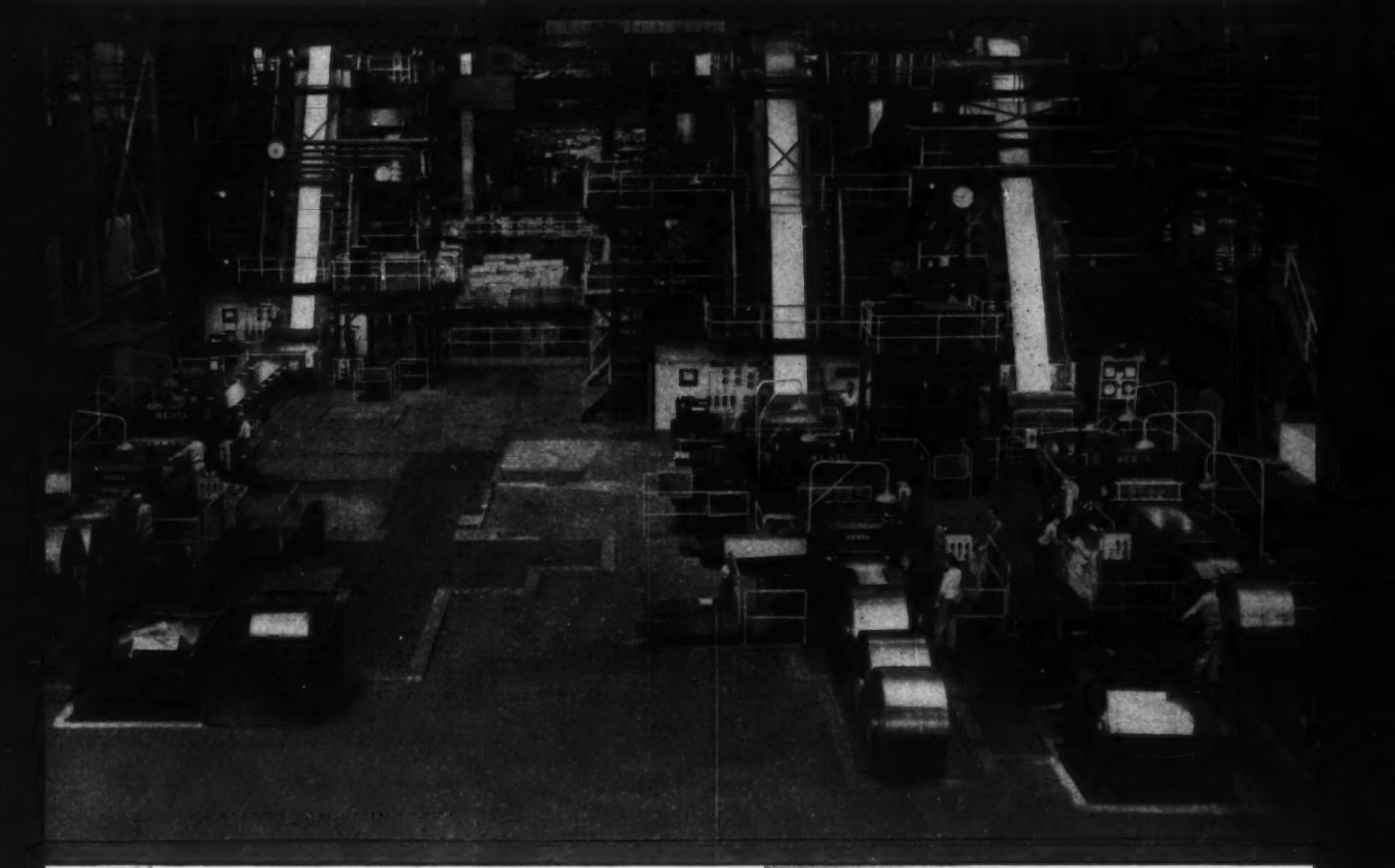
The trend is an outgrowth of knowledge gained from scientific and business applications. The goal: One central data processing system which will handle production processes, business needs, and scientific investigation.

• **What's Being Done** — W. E. Miller, manager, metal rolling and processing engineering, General Electric Co., Schenectady, N. Y., says you can have any kind of performance you want in an electrical system. But the question of what is practical and economical has to be determined by a formal approach called "operations research and synthesis study."

Simple replacement of an operator with automatic equipment is probably not the best solution, says Mr. Miller. Present equipment was designed for manual control. Different designs or modifications are needed for practical application if you're going to get the best out of an automatic system.

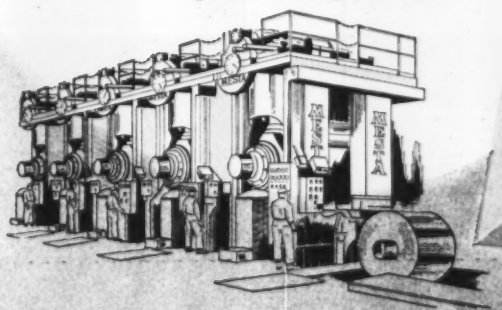
The first programming of hot strip finishing mill screwdowns is installed at Geneva Works, Columbia-Geneva Div., U. S. Steel Corp., Provo, Utah. Programming is done with decade pushbuttons. An operator can preselect screwdown settings for the next slab while one is still in the mill. It gives him more time to make a selection. Also, screwdown position regulators permit gage control to function more rapidly and accurately.

• **Concepts** — Feedback control is the basis of all modern drives. Once



THREE MESTA 48" CONTINUOUS GALVANIZING LINES WITH FEED REELS, AUTOMATIC MASH WELDERS, TENSION REELS, AND ROTARY FLYING SHEARS WITH LEVELLERS.

Continuous galvanizing lines



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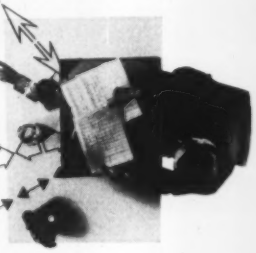
Not in inventory control alone—but in every area of manufacturing—from machine scheduling to market forecasting, from engineering planning to cost analysis, new IBM techniques are revolutionizing management control of manufacturing. In scores of companies, IBM data processing systems are supplying information once impossible to obtain . . . closing the time lag between fact and report . . . and reducing the over-all costs of production.

All these benefits can be brought to your business, too, with methods drawn from IBM's many years of experience.

For all the facts on IBM Data Processing, and complete details on IBM Inventory and Manufacturing Control Methods, call your local IBM representative.



IBM®
DATA PROCESSING

input is set, it regulates, monitors, and automatically holds set values.

The newer forms like automatic gaging include the process as an element of feedback control. As systems becomes more complex, more regulators will be added to monitor and control product qualities. That is why data processing and computers are necessary. They will automatically log electrical, process, and product quality data, evaluate and compare them with previous experience. The computer then automatically reprograms the process to get better results.

• **Reliability**—You can expect such installations to be larger, more expensive, more productive, and more complex than those now in operation, says Mr. Miller. You won't be able to justify a lengthy shutdown so there will be less time allowed for maintenance.

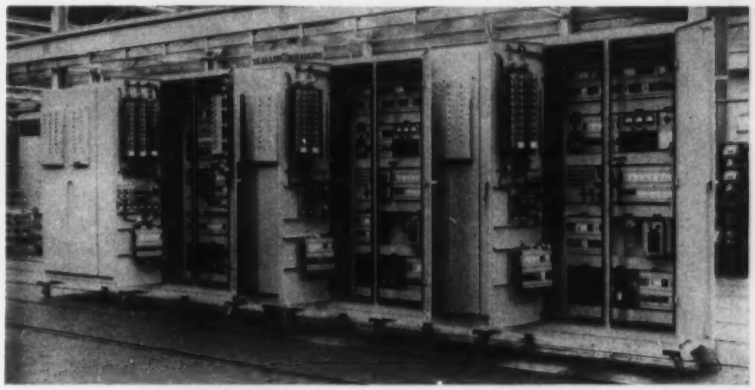
Reliability relates to the number of elements in a system. You can expect that components will be much more dependable in tomorrow's installations. Dual channels, independent feedback loops, and self-checking circuits will be used. As in today's installations, there will be widespread use of transistors or their equivalents.

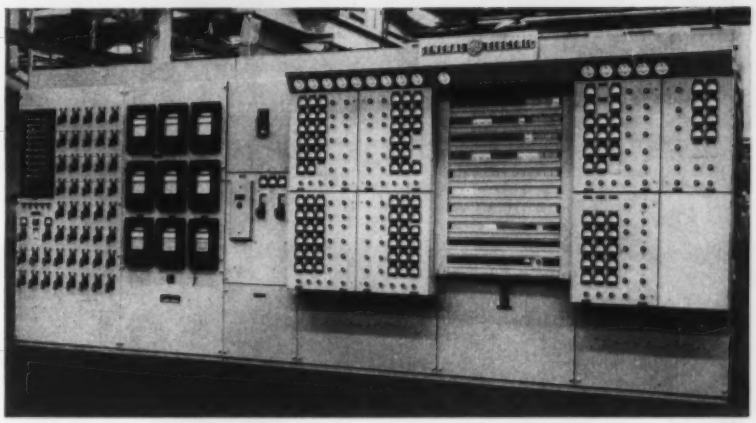
• **Applications**—What would happen to the elements of a drive system when you apply such a system? We can get an idea from the main drive motor, the largest and most expensive element.

General Electric has just redesigned such motors. The twin drive type locates the top motor forward next to the mill. A forged flange coupling solved the problem of this unusual arrangement. Quick removal covers also make commutator stoning and grinding much simpler, a feature which greatly reduces downtime and promotes efficiency since that operation may be done more frequently. Integral ventilation and new constant-pressure brush holders also contribute to a design that will fit in with the complete automation concept.

Static switching on a reversing universal slabbing mill is another contribution.

• **Programming** — Punched cards are being used for reversing roughing mills, structural mills, plate mills, and universal slabbing mills. Several plants recently introduced them for hot strip finishing and tandem cold strip mills.





Typical control panels for automatic program control include "deadfront" panels, static elements, and indicating lights. Program and readout console is tied in

A small industrial card reader is used for steel mill applications. It works directly into static switching, eliminating control units previously needed. It uses light instead of contact; readout doesn't require external storage.

The first installation in a hot-strip mill was made not long ago. It is coupled with preset programming of mill roll opening.

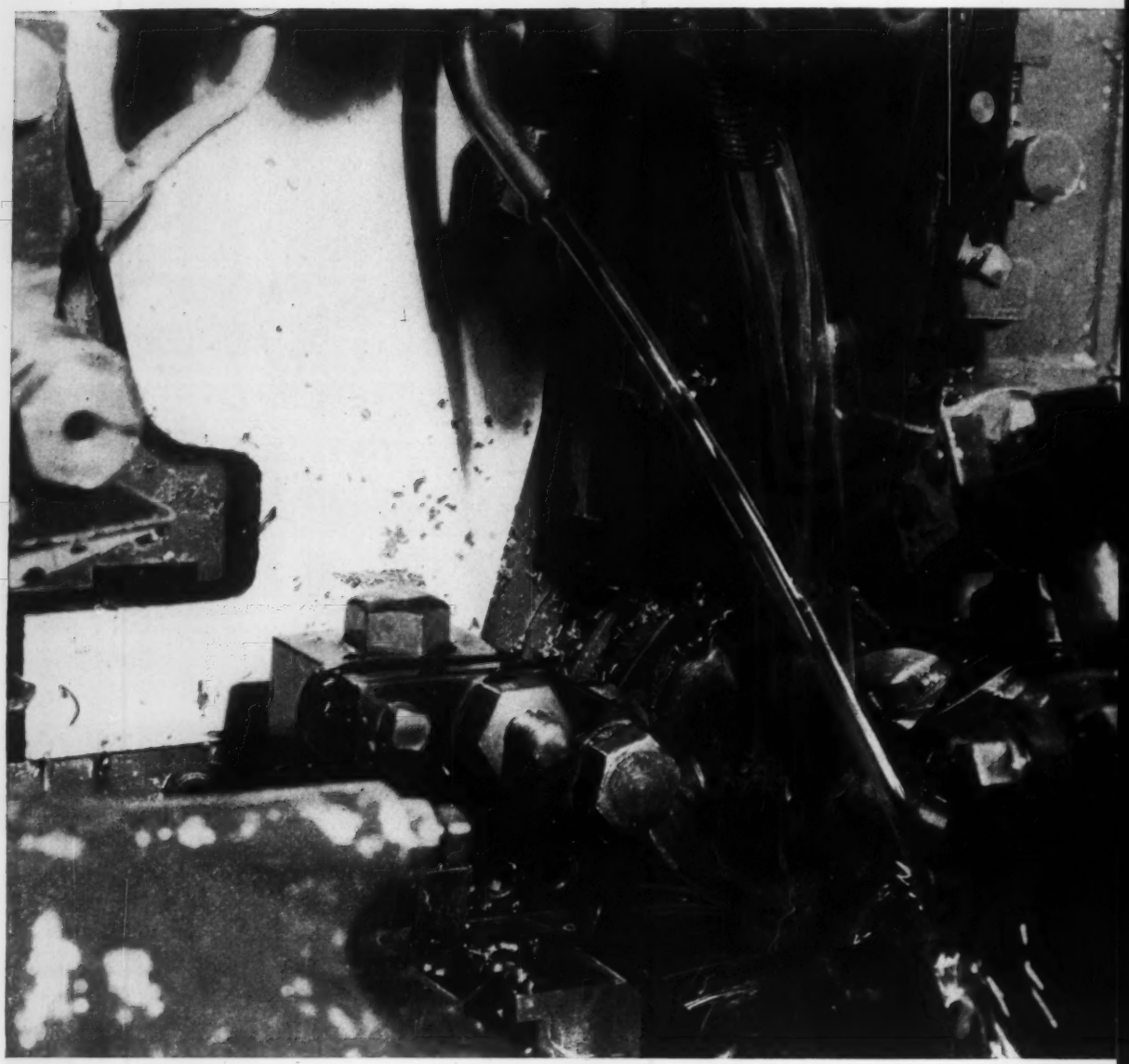
Computer analysis had much to do with the success of automatic hot strip mill gaging, which is a lot different from that required for a tandem cold reduction mill.

General Electric's approach (called a gagemeter) is novel. The mill stand itself is the sensing element. The stand and rolls act as a large spring. Strip thickness is found by calculating the separation of the rolls before and after the metal enters.

GE measures roll separating force with load cells behind the backup roll chocks. The force is divided by the spring constant of the mill (in pounds needed to separate the rolls 1 in.). The result is added to unstressed roll separation to get the stressed roll separation. It is an instant indication of thickness change and eliminates transport time between stand and radiation gage.

• **Shortcoming**—The gagemeter approach doesn't take into account temperature changes affecting roll diameter, so it has to be constantly recalibrated with a thickness gage. One answer is General Electric's new Raymike 600, an x-ray device that can measure thicknesses with an accuracy of better than 99 per cent. When used with the gage-

(*Please turn to Page* 120)



Holds tolerances of .0005 on stainless steel . . . cuts time

GULF MAKES THINGS

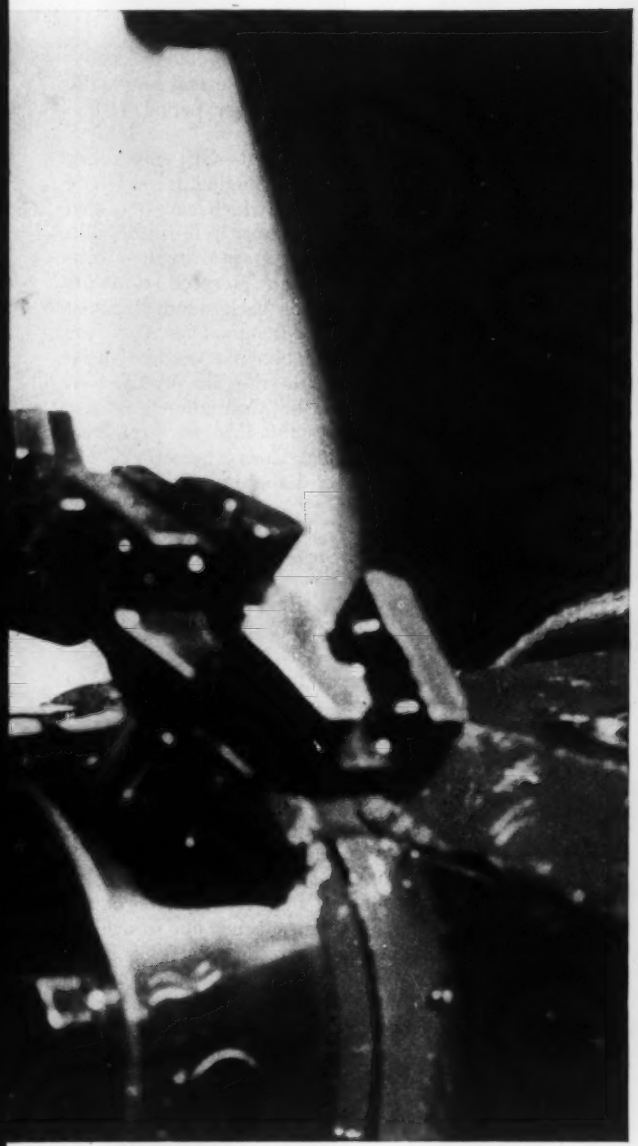
"Quite often we are required to hold to tolerances of .0005 on stainless steel in both automatic and hand screw machines," reports Wallace J. Perzanoski, Foreman of the Screw Machine Department, Cramer Controls Corporation, Centerbrook, Connecticut.

"The two cutting oils we now use . . . Gulfcut 41C for stainless steel and bronze, and Gulfcut 31A for regular brass and cold rolled steel . . . help us hold to critical tolerances. Moreover, we have shortened the time cycle on some jobs by 25 per cent," he added.

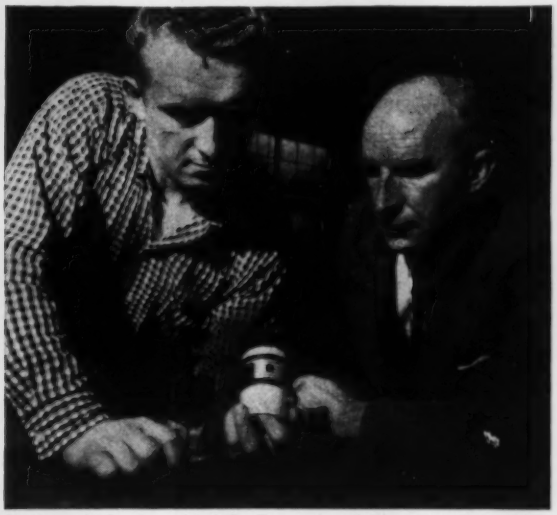
Cramer makes synchronous timing motors and precision electrical timers for commercial, industrial and military uses. Cramer's line of internal timers, time delay relays and others must meet the most critical specifications for structural and operating accuracy.

A typical precision job at Cramer is the machining of pinion posts for hermetically sealed timers which must meet rigid military specifications. Machining—on a Brown & Sharpe automatic—includes feed, rough turn, finish turn, form, cutoff and slotting.

Several years ago, Mr. Perzanoski's department was using 7 or 8 different cutting oils. After consultation



Precision machined pinion posts made by Cramer for Type 430H hermetically sealed timers. Piece is of 303 stainless steel, ½ inch long. Machining time 25 seconds per piece. Gulfcut 41C helps speed up this operation.



Wallace J. Perzanoski, left, Foreman of Cramer's Screw Machine Department, checks a timer part with B. F. Kimball, Gulf Sales Engineer. Gulfcut Cutting Oils help Mr. Perzanoski get finer finishes, closer tolerances, at higher speeds.

cycle 25% using Gulfcut . . .

RUN BETTER!

with a Gulf Sales Engineer, they reduced this to two Gulfcut oils, 41C and 31A. These two versatile oils serve for their complete range of tough machining jobs.

"Another feature of these Gulfcut Cutting Oils that our operators appreciate is the non-staining characteristic which makes them easier and cleaner to work with," said Mr. Perzanoski.

How about *your* cutting oil performance? See how Gulf makes things run better in your operation. Just call the Gulf Sales Engineer at your nearest Gulf office, or mail the coupon.

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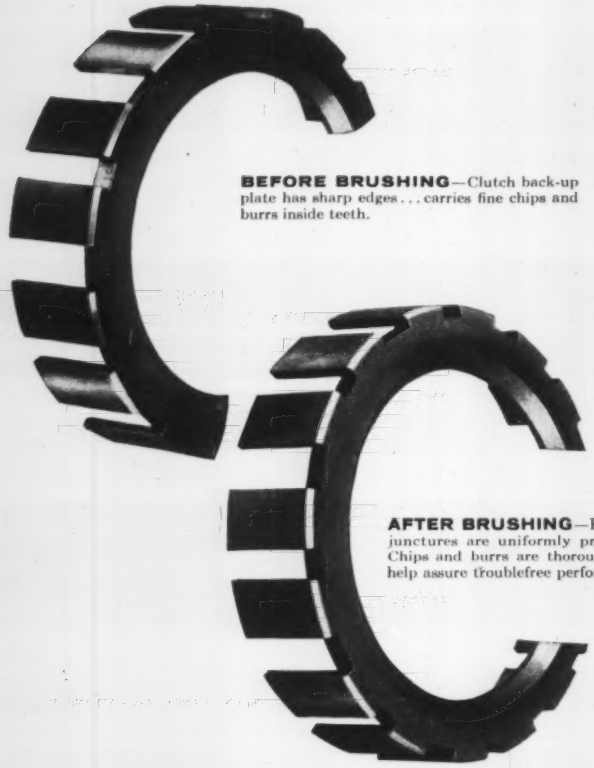
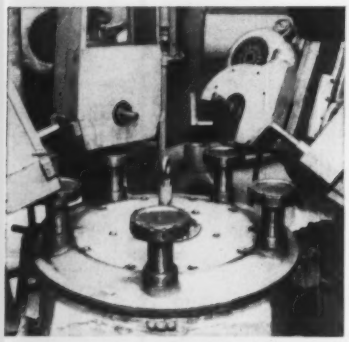


BEFORE BRUSHING—Clutch back-up plate has sharp edges . . . carries fine chips and burrs inside teeth.

AFTER BRUSHING—Edges and surface junctures are uniformly precision blended. Chips and burrs are thoroughly removed to help assure troublefree performance.

Auto maker races to a perfect finish

. . . cleans, blends 450 parts-per-hour with OSBORN Power Brushing



4 POWER BRUSHING HEADS plus a 6-station index table setup produce a quality finish for automotive clutch parts. Osborn Monitor® Brushes — working at 1750 rpm — automatically deburr and blend 450 parts-per-hour in this low-cost operation.

THESE clutch back-up plates—product of a leading auto manufacturer—are quality finished at high production rates with versatile, low-cost Osborn Power Brushing.

The job requires blending sharp edges and surface junctures of the intricately shaped parts . . . plus thoroughly removing fine metal chips and burrs that could later cause trouble in the clutch assembly. *This Osborn rotary power brushing setup does the entire blending and deburring job rapidly, uniformly, economically. Rate: 450 parts-per-hour.*

Low-cost precision finishing like this can be applied to many types of products you build today. An **O**sborn **B**rushing **A**nalysis — made in your plant at no cost or obligation—can pinpoint where *you* can speed production . . . improve quality . . . cut costs with modern power brushing methods. Write or wire us for details. *The Osborn Manufacturing Company, Dept. S-5, Cleveland 14, Ohio.*

Osborn Brushes

BRUSHING MACHINES • BRUSHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

AUTOMATIC MILL . . .

meter, it will enable real automatic control for a longer period.

• **Hot Strip Mill**—GE emphasizes that automatic gaging is only one of many steps which can be taken to improve a hot strip finishing mill. Recalibration of speed by gage control is important, so speed regulators are needed on each stand as a first step—using them alone cuts the number of cobbles and gage variations. Three mills already use that approach: Cornigliano, Genoa, Italy; Columbia-Geneva Steel Div., U. S. Steel Corp., Geneva, Utah; Jones & Laughlin Steel Corp., Cleveland.

• **Cold Strip Mills**—A different approach is needed for cold strip mills, says J. A. Lindner, Industry Control Dept., General Electric Co., Roanoke, Va.

It used to be necessary for an operator to make constant adjustments to make on-gage strip. The x-ray gage (automatic gage control system) relieved him of some of the manipulations. The result is a fairly uniform coil, but there is no tangible evidence that it is uniform. Data logging goes a step farther by taking over some of the operator's headaches and providing a permanent record.

Data logging and programming control quality, production, cost, and accounting in a cold strip mill.

The mill itself has this equipment: An x-ray gage for coarse adjustment after the first stand; an x-ray gage after the last stand for vernier control; a footage meter operated by a billy roll after the last stand. Programming is introduced by punched cards and a certain amount of operator control. Data are recorded and typewritten automatically.

These are the benefits:

Fewer skilled operators are needed.

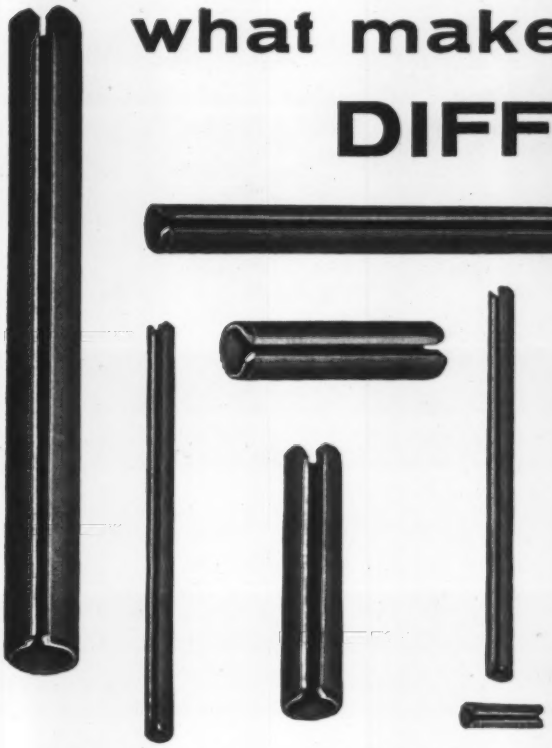
You get a permanent, accurate production record automatically and continuously.

Complete data permit proper classification of each coil for subsequent routing and processing.

Predetermined settings reduce the importance of operator judgment.

Recorded data aid in the analysis of breakdowns and shutdowns.

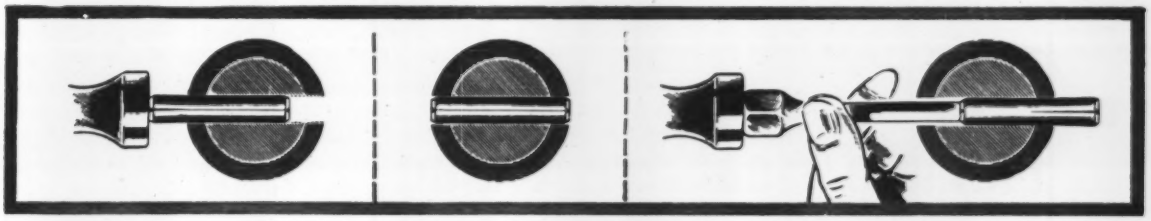
what makes this fastener DIFFERENT?



Several things. Rollpin® is a slotted, chamfered, cylindrical spring pin which drives easily into a hole drilled to normal production standards. It locks securely in place, yet can be drifted out and reused whenever necessary. This eliminates special machining, tapping, and the need for hole reaming or precision tolerances. Rollpin replaces taper pins, straight pins and set screws; for many applications it will serve as a rivet, dowel, hinge pin, cotter pin or stop pin.

And here's another difference that makes Rollpin the quality fastener in the field: ESNA's quality control builds consistent strength and performance into every Rollpin. Rollpin is uniform as to shear strength, dimensions, hardness, and insertion and removal forces

HOW YOU INSERT IT



Drives easily by hammer, arbor press, or air cylinder and can be readily adapted to an automatic hopper feed. Requires only a standard hole, drilled to normal production-line tolerances.

Locks securely in place without using a secondary locking device; won't loosen despite impact loading, stress reversals, or severe vibration.

Removes readily with a drift pin without damage to pin or hole, can be used again and again in original hole.

HOW YOU SAVE

You pay less for Rollpins than for most tapered, notched, grooved or dowel pins. Installation costs are substantially less than for any fastener requiring a precision fit or secondary locking operations.

Because of their tubular shape, Rollpins are lighter than solid pins. Production maintenance is reduced with Rollpins: they do not loosen and because of their spring action they tend to conform to the drilled hole in which they're inserted, without material hole wear, eliminating the necessity of re-drilling or using oversize pins.

MATERIALS AND SIZES

Standard Rollpins are made from carbon steel and Type 420 corrosion resistant steel. They're also available in beryllium copper for applications requiring exceptional resistance to corrosive attack, good electrical, anti-magnetic, and non-sparking properties. Stock sizes range from .062" to .500" in carbon and stainless steels.

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☐ Elastic Stop nut Bulletin

☐ Here is a drawing of our product. What self-locking fastener would you suggest?

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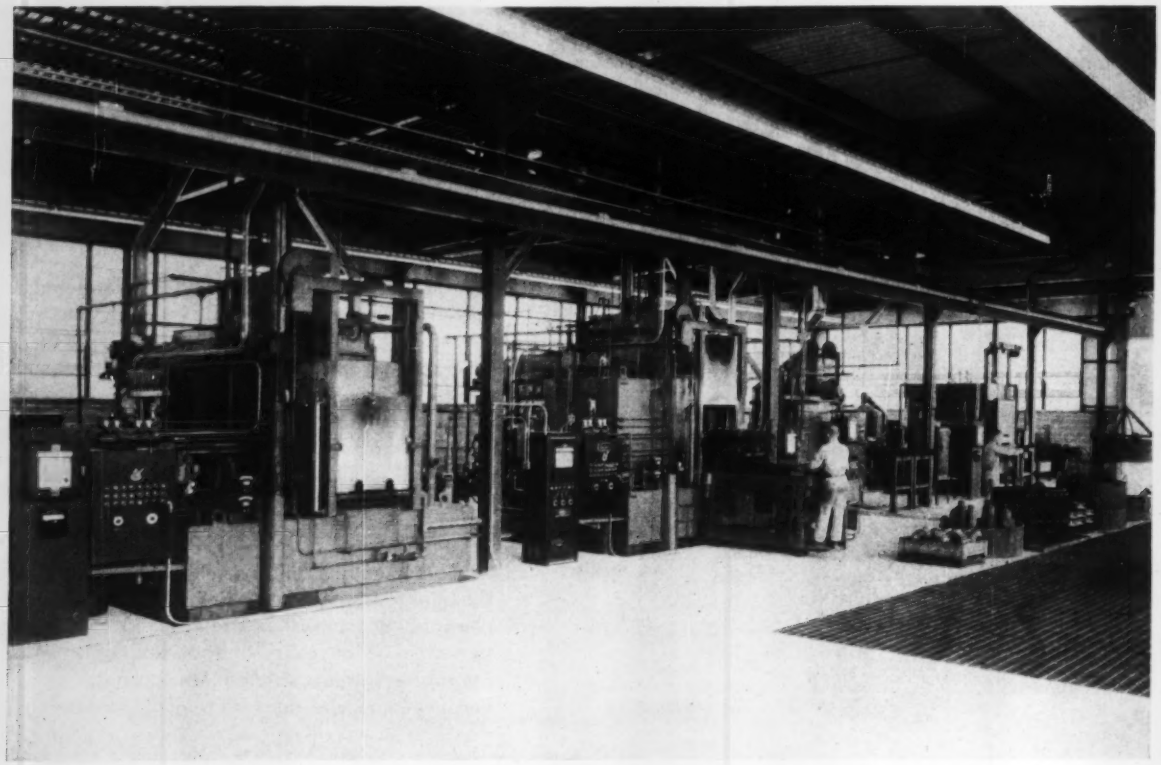


Over-all view of Milwaukee Gear Co.'s heat treating line showing the two atmosphere controlled furnaces, the spray washer, and the horizontal, air draw furnace. A circular pot type hardening furnace is just behind the tempering unit

Flexible Heat Treat Line Keeps Jobbing Economical

Manufacturer of precision gears has reduced costs and shortened delivery schedules by installing mechanized batch furnaces in a production line

FLEXIBILITY in heat treating may be the key to improved product quality, reduced operating costs, increased production, and firm delivery schedules.

If you are processing a wide variety of job lots, your heat treat installation deserves careful consideration. You may get some help in planning your facility from this case history. It shows how one company answered questions of size and capacity, operation, degree of mechanization, best method of atmosphere control, fixturing, and physical arrangement.

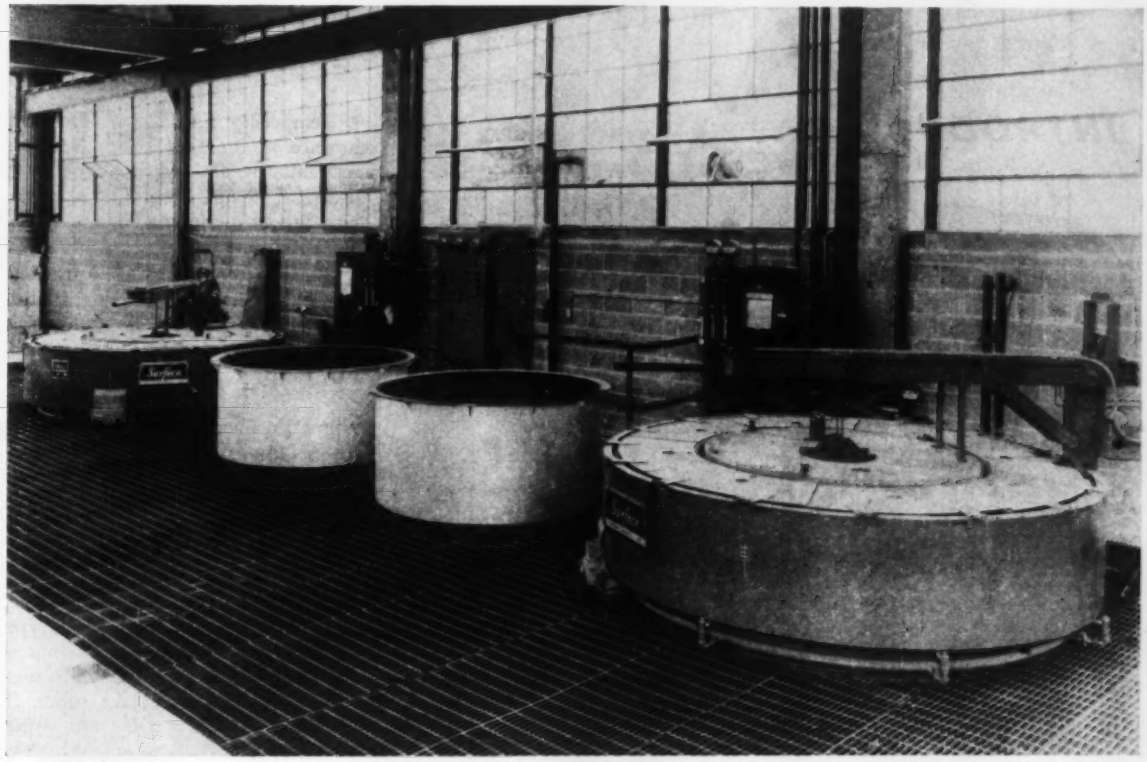
• **Gearmaker's Problems**—Milwaukee Gear Co., Milwaukee, produces gears in thousands of shapes and sizes from carbon and alloy steels in the form of rolled bar stock, forgings, and castings. More than 80 per cent of the gears require some type of heat treatment.

The company recently added a new building and complete heat treating facilities. Since all equipment was to be new, the heat treating specialists had a wide-open choice, explains John Lotter, chief metallurgist. The equipment was selected for continuous operation and maximum flexibility.

• **Heat Treat Facility** — Surface Combustion Corp., Toledo, Ohio, built the equipment—two atmosphere controlled furnaces, a horizontal convection furnace, a circular pot type hardening furnace, and two pit-type carburizing furnaces.

The gearmaker also has a spray type washer with temperature control, a 200 cfh exothermic gas generator, a 2400 cfh endothermic gas generator with signaling dew point control, and an automatic dew point control system to be used with one of the atmosphere controlled furnaces.

Except for the pit furnaces, all the equipment is in a line. Movement in and out of the furnaces is facilitated by a motorized transfer



The two, pit-type atmosphere furnaces. The one at right is used to anneal, normalize, or carburize shafts and gears. The other unit is used to atmosphere draw similar work. Endothermic or exothermic gas can be used with either furnace

car which moves on rails that extend the full length of the installation. The two pit furnaces are installed directly opposite the line of equipment, separated by a wide aisle.

• **Key Units**—The majority of work is done in the two atmosphere controlled furnaces. They are used individually and in combination for carburizing, hardening, carbonitriding, carbon restoration, homogeneous carburizing, annealing, and hot oil quenching.

Each furnace has a 2000 gallon enclosed quench tank heated by gas fired immersion burners. Advantages of hot oil quenching gears: Better metallurgical properties; expensive presses and special fixtures are not needed; and costly finishing steps, such as straightening and cleaning, can be eliminated.

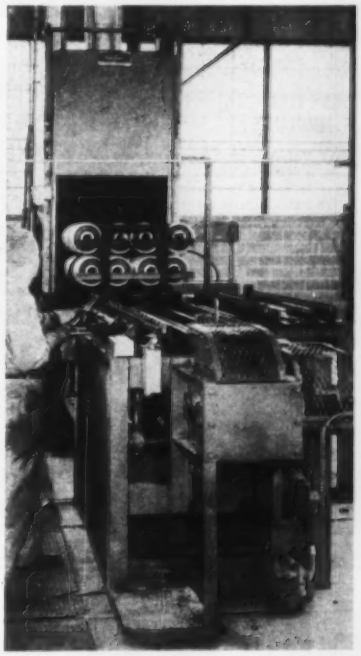
One atmosphere controlled furnace is used primarily for carburizing. The second has a slightly different quench tank arrangement; it has a cooling chamber at one side of the vestibule over the quench tank. The feature makes it possible for the furnace to be used as an atmosphere draw unit as well as for slow or fast cooling.

• **Gas Generators**—The 2400 cfh endothermic gas generator supplies the atmosphere for the two furnaces as well as for the pit-type furnaces across the aisle. Endothermic gas is used in the pit furnaces for carburizing, hardening, annealing, or normalizing.

When atmosphere for drawing is required in the pit furnaces, the source of atmosphere is switched to the 2000 cfh exothermic gas generator.

• **Spray Washer**—The temperature controlled washer will handle furnace trays 24 x 30 in., loaded to an effective height of 30 in. It is heated by gas fired, immersion burners.

There is a table directly in front of the washer. Work is placed there until its structure transformation is complete. An auxiliary table is at



Work is charged into the temperature controlled spray washer from the motorized transfer car

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the right of the washer in alignment with the motorized transfer car.

• **Tempering Furnace** — The last furnace in the line is a horizontal, recirculating air, drawing type. It is used for tempering following carburizing or hardening, where use of an atmosphere is not required.

Straight tempering of hardened gears and pinions is handled in the unit. When atmosphere tempering is required, the two pit-type furnaces may be used.

• **Pot Furnace**—A circular pot furnace is immediately behind the horizontal tempering furnace. It is used for short runs or specialized hardening jobs where it would be uneconomical to tie up one of the larger units.

• **Pit Furnaces**—The two pit type furnaces are identical in dimensions. The first is heated by 12, suction type, vertical radiant tubes. It is used mainly for cycle annealing and normalizing of shafts and gears and also for carburizing similar parts in an atmosphere of carrier gas from the endothermic generator that is enriched with natural gas.

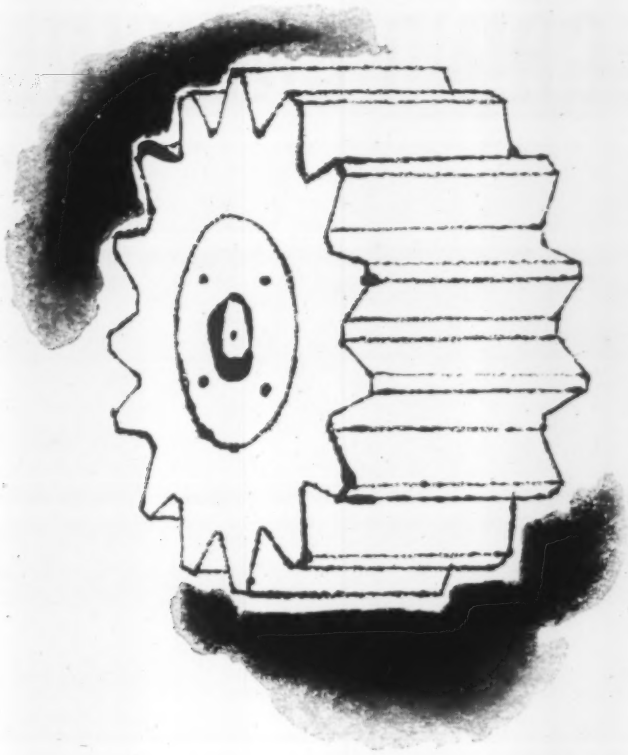
The second pit furnace is heated by eight, suction type, vertical radiant tubes. It is more frequently used for atmosphere drawing of shafts and gears in gas supplied by the exothermic generator.

Quenching of parts processed in the pit furnaces is done in two cylindrical tanks between the furnaces.

• **Metallurgical Control** — All incoming steel bars, castings, and forgings are subjected to metallurgical tests to determine the chemistry, grain size, soundness, response to carburizing, and inherent hardenability.

Metallurgical testing permits the evaluation of the quench microstructure and uniform tempering temperature and results in uniform final hardness for all orders—even when the steel is from more than one heat. It eliminates rejects in large cross sections where high hardness values are specified.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Gears... Cutting Oils... and How to Save Money

The more gears your equipment can hob before tool change, the lower your cost of operation. Sinclair Ordnance Cutting Oils have earned the reputation for increasing tool life because of their high heat dissipation characteristic. Furthermore, a special E. P. agent assures the highest quality finish . . . more money saved through fewer rejects. Switch to Ordnance, now. Next time management asks how you've cut costs, tell them you've changed to Sinclair—and show them the results.

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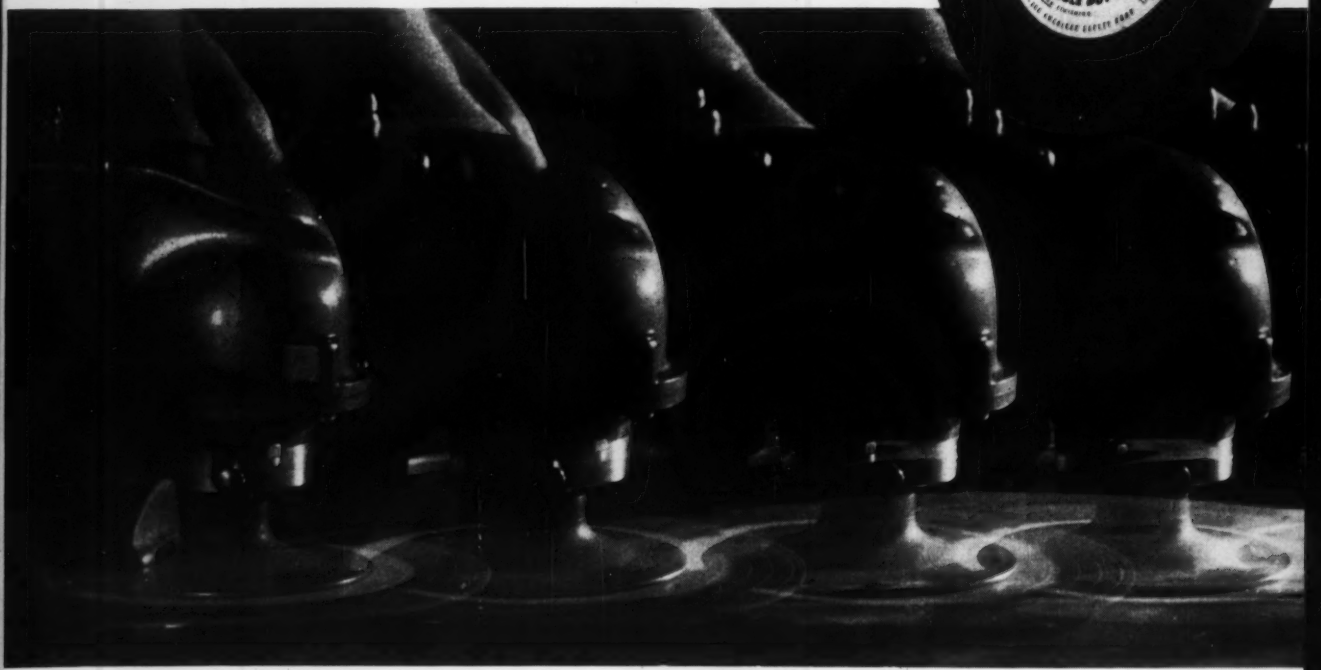
NEW BAYFLEX DOUBLE-DUTY



Illustrations above show Bayflex Double-Duty in action, held at correct angle for weld bead grinding (top) and for finishing (bottom)

WITHOUT CHANGING WHEELS!

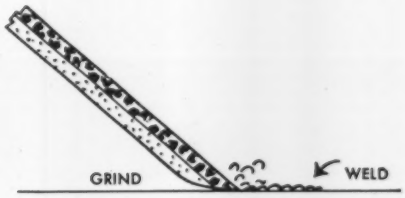
There are two important angles to consider before you buy new weld-grinding or finishing wheels. Bay State's new Bayflex Double-Duty raised hub disc-wheel has them *both!*

The "DD's" unique, two-layer construction gives you two grinding angles: One is 30° - 45° which gives you fast stock removal for grinding weld beads . . . and the other is 10°- 20° which gives you a finish without gouging, a finish so smooth it's just short of a polished surface.

The upper layer for weld grinding comes in a single, standard specification. The lower finishing or blending layer comes in your choice of five different grits (24, 36, 54, 80 and 120) for every type of finishing job from heavy steels through light stainless sheets to aluminum and copper.

Your Bay State representative is ready now to demonstrate the Bayflex Double-Duty in your plant under normal working conditions. Get in touch with him and see what he can do to cut costs and speed up your weld grinding. You'll find he's more than a good salesman . . . because he's an experienced abrasive specialist, too. *Better grinding at lower cost . . . that is his business.*

IS 2 WHEELS IN 1



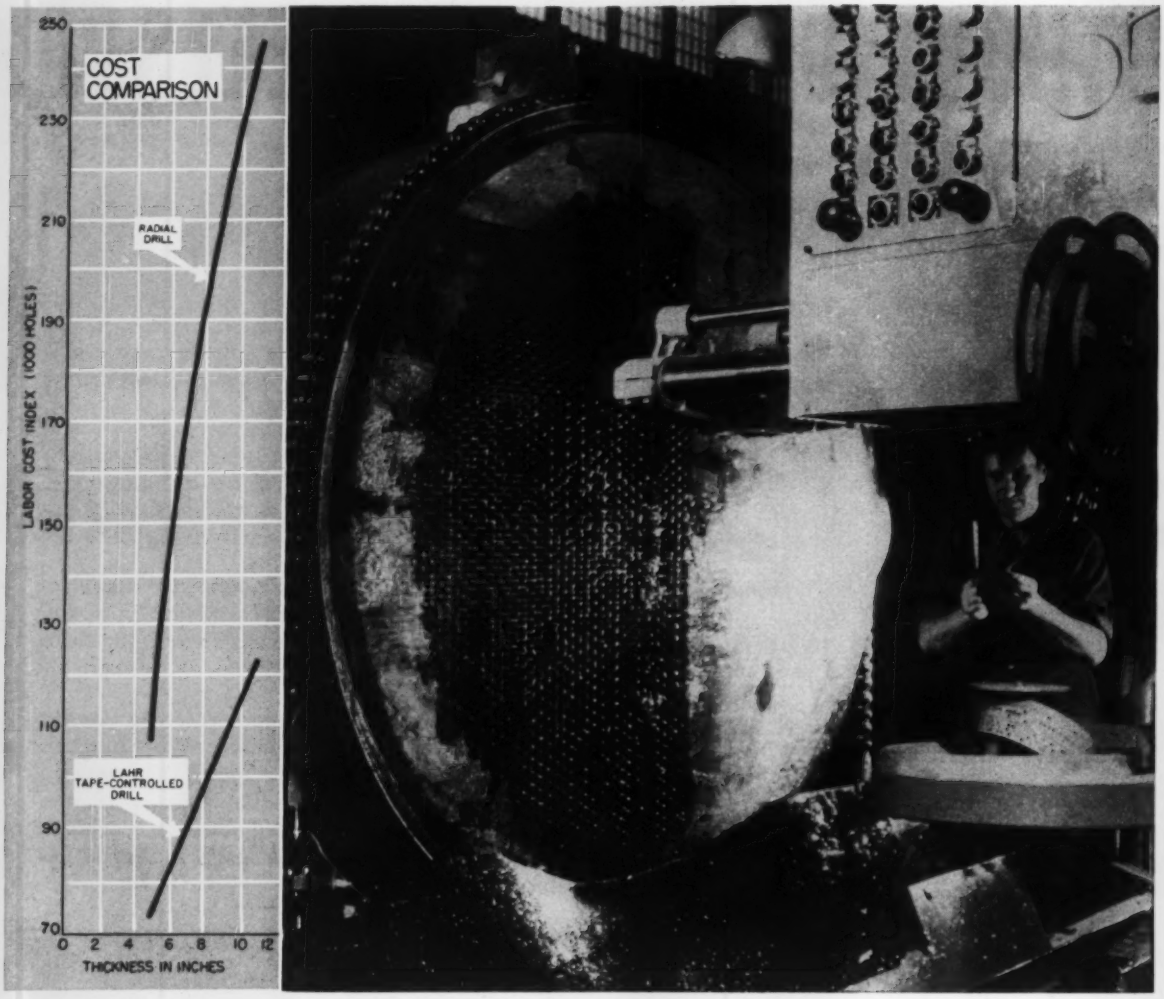
Upper layer removes stock rapidly when disc is held at 30° - 45° angle.

Lower layer smooths and blends surface when held at 10° - 20° angle.

BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Mass.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh, Los Angeles.
Distributors: All principal cities



A target drill is putting closely packed holes through a tube sheet that's 7 in. thick. Tool drift will be held to 0.001 in. for the whole depth. Left: How Alco engineers figure labor costs compare for conventional drilling and tape guided drilling. The thicker the sheet, the higher the labor cost

Tape Guided Target Drills Reduce Complex Part Cost

Parts are as thick as 11 in.; some have more than 2000 holes in them. Tape control positions the drill spindle; gun and target drills boost cutting performance

TAPE guided target drilling has trimmed 35 per cent off the over-all cost of drilling tube sheets at the Thermal Products Div. plant of Alco Products Inc., Dunkirk, N. Y.

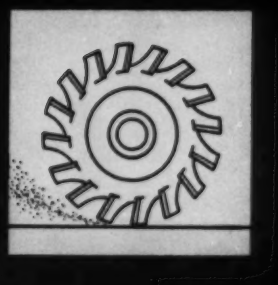
The two horizontal drilling and boring machines that do the job were built at Lahr Machine & Tool Corp.'s plant at Toledo, Ohio.

• **Operation**—Both machines are guided by Warner & Swasey Tele-Probomat control systems that read instructions from a standard, eight hole, 1 in., Mylar perforated tape. A typical job for the machines: Drill more than 2000 tube holes in a pair of stacked tube sheets; each is 7 in. thick.

The machines will run 300 to 5000 rpm under direct drive, and they have a positioning range that's 6 by 6 ft. Maximum drilling depth is 24 in.

• **Tooling**—Drills range from 3/16 to 1¼ in. They have carbide cut-

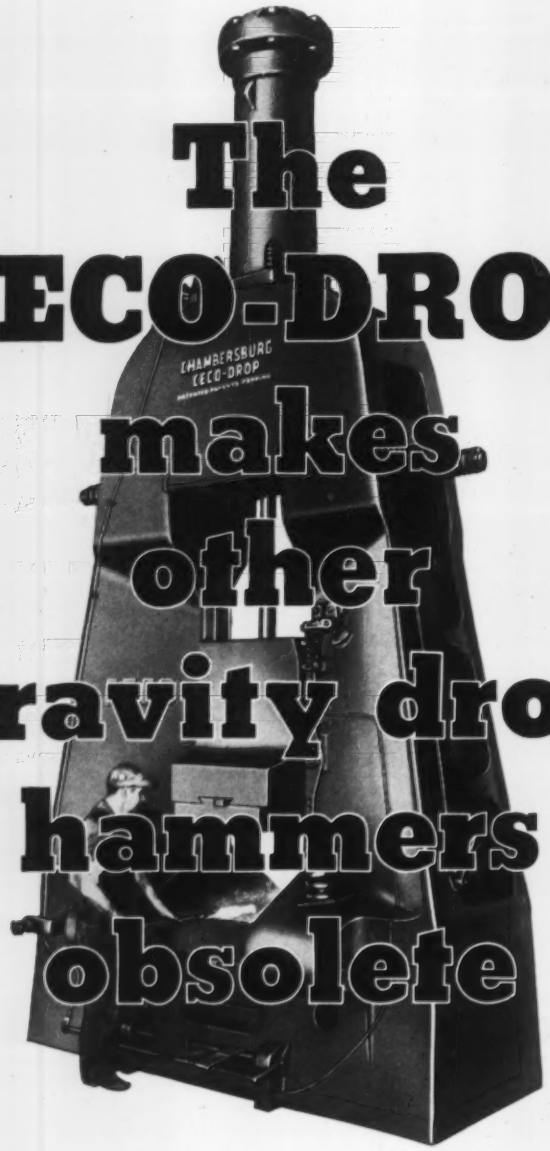
(*Please turn to Page* 134)



vega air-hardening tool and die steel is the easiest to machine of all air-hardening tool steels. Vega was specially developed by Carpenter to combine toughness and the machining properties of an oil-hardening steel with the safety in hardening of an air-hardening grade. It is safe to harden and even intricate dies with many cutouts, sharp corners and thin sections come through heat treatment with outstanding freedom from distortion and size change. Call your local Carpenter Service-Center for immediate delivery from complete stocks.

the *Carpenter* Steel Company, Reading, Pa.

The CECO-DROP makes other gravity drop hammers obsolete

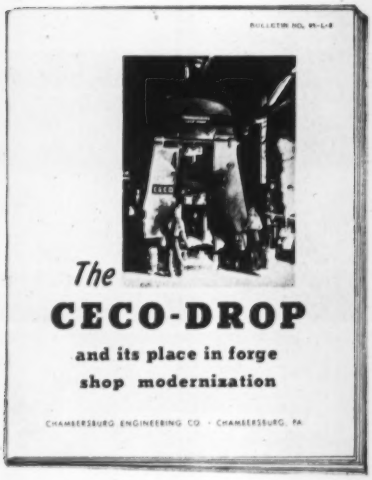


THIS is no mere slogan; it is a statement of fact. Since its introduction twelve years ago, the Ceco-Drop, in installation after installation, has proved its greater productive capacity and its economy over any other gravity drop hammer.

These are not unsupported claims. They are backed up by testimonials from users: like **"increased production over board drop between 10-20%"**; "die life on the Ceco-Drop is nearly double"; **"the first two Ceco-Drops have saved approx. $3000 each** in maintenance and boards in first year"; "after approx. 1200 production hours, one Ceco-Drop had total of less than 10 hours maintenance"; **"I would give a good deal if I had all of our board hammers out of the shop and nothing but Ceco-Drops"**; and hundreds of others.

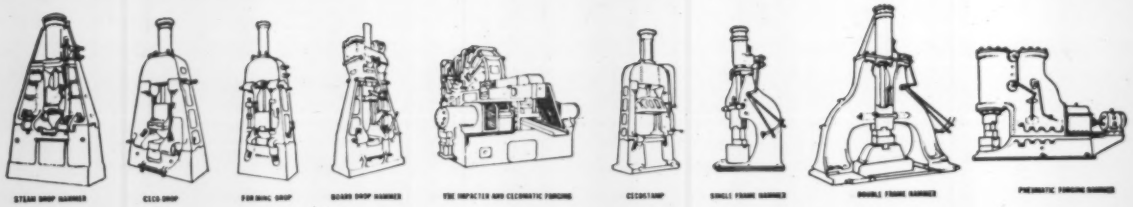
To convince yourself, you should read Chambersburg's 28-page bulletin on Forge Shop Modernization.

Send for your copy today.



CHAMBERSBURG ENGINEERING COMPANY . . . . . CHAMBERSBURG, PENNSYLVANIA

CHAMBERSBURG • The Hammer Builders



Tubexperience in action

How does carbon content control hydraulic tubing quality?

Precise metallurgical controls help Superior's (SAE) Hydraulic Tubing outperform all other types

*Extra quality is the reason for the high ductility and longer, more reliable service you get with Superior hydraulic tubing. This extra quality is actually built in through precise metallurgical control.

Carbon content is held to .12% maximum through controlled atmosphere annealing. This assures highest ductility commensurate with the strength needed in the tubing.

Superior (SAE) Hydraulic Tubing is made from selected billets of non-aging steel. These are segregated by heat numbers, and a customer's order is always filled from one heat. This assures complete uniformity of all the tubing shipped to him in that order.

Each order also undergoes many critical examinations. Among these are checks on elongation, yield and ultimate strength. Every length is also 100% hydrostatically tested to maximum working pressure. And close control is exercised over grain size and microstructure. This is done microscopically with the aid of metallographic mounts. And finally, if requested, we furnish a notarized report on the chemical and physical properties of the tubing produced.

Superior (SAE) Hydraulic Tubing is furnished in dead-soft annealed temper for easy bending and flaring. Order in cut, multiple or random straight lengths up to 30 ft.—or longer in coiled form.

For more data on our (SAE) hydraulic tubing, get a free copy of Bulletin 39. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Superior Tube

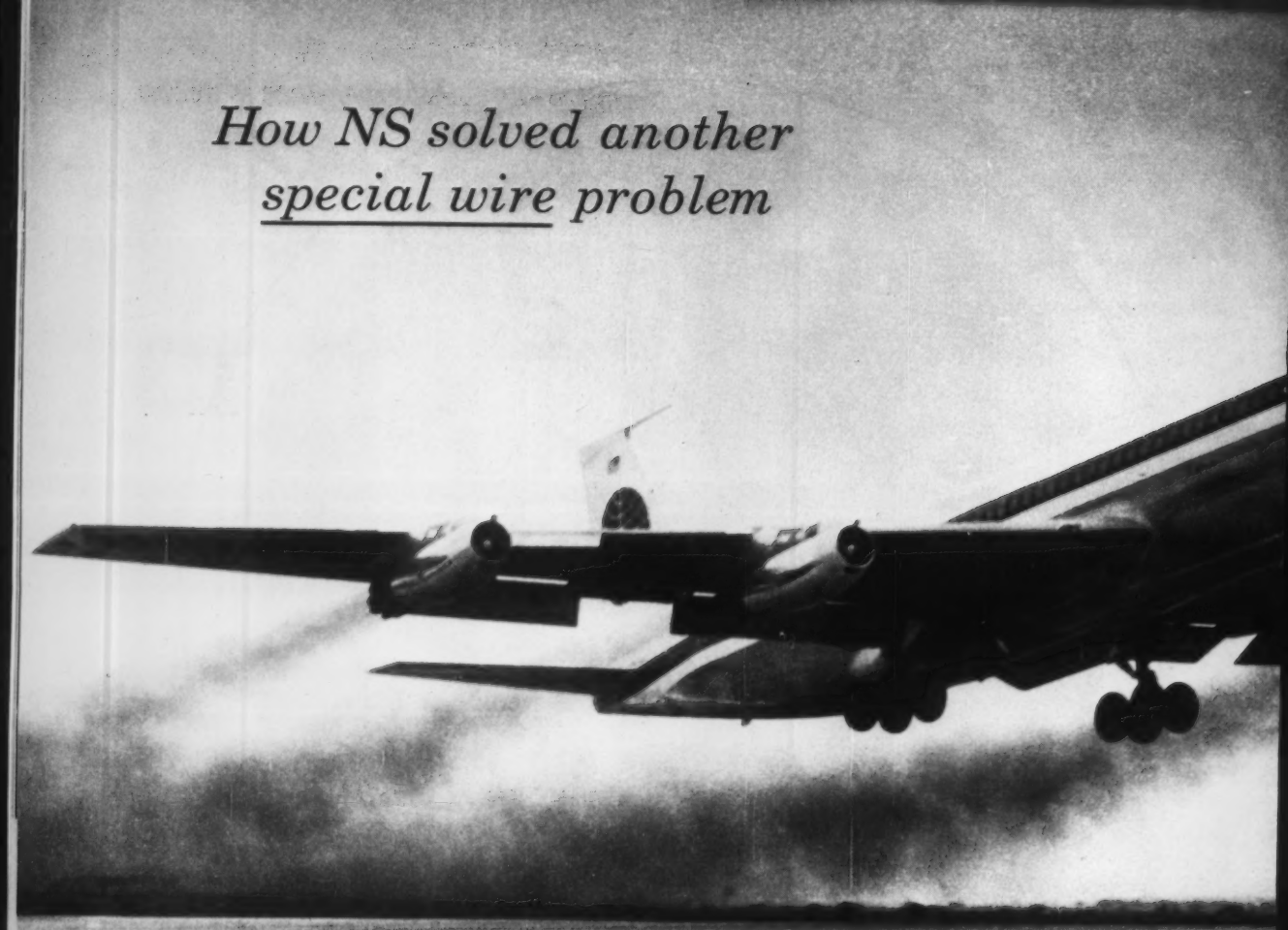
The big name in small tubing

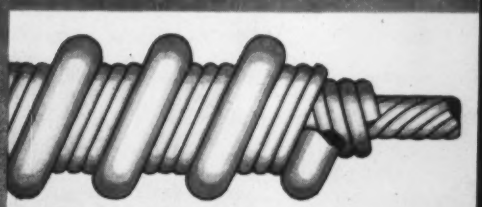
NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company • 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

How NS solved another special wire problem





REMOTE CONTROL cable for jet aircraft is made of layers of high-tensile National-Standard wire wound around a stranded core. Heavy outer wire provides helix or worm-gear surface for meshing with hobbed wheels.

Photo courtesy Pan American Airlines

Special National-Standard wire helps fly new jet-liners

When the age of commercial jet transportation in the U.S. began last January, giant jet-liners inaugurated flights across the country at speeds over 600 mph. To control these new aircraft swiftly and easily requires control cables of the utmost reliability, efficiency and endurance.

NEW COMMERCIAL JET-LINERS, as well as many military aircraft, are flying now with a unique remote control cable system made of special high-tensile wire wound around a stranded core with a heavy outer wire of stainless steel wound to a pitch of 10 per inch. This outer wire acts as a helix to engage hobbed wheels within the various system control boxes.

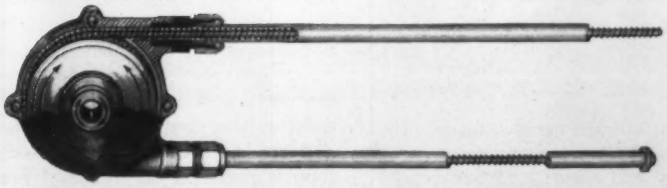
NATIONAL-STANDARD ENGINEERS worked closely with a control-cable system manufacturer to develop wire of just the proper alloy and rugged physical properties required to withstand extreme temperature and flight stress variations. National-Standard submitted wire samples to microstructural studies and physical tests to assist the customer in determining the conditions that would allow bending cable around pulleys without giving a permanent set to the cable. In addition, alloy steels with various coatings were tested to improve wear and galling resistance for various applications. The result was the development of a special stainless-steel wire that exceeded rigid specifications.

EXPERIENCED ENGINEERING HELP, of this kind, for jobs requiring high-quality wire to meet special or unique applications, is available to *you* from National-Standard. For any of the many thousands of applications where only special wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

Manufacturer of specialty wire and metal products

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS,** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY,** Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL,** Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE,** Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS,** Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



FLEXIBLE CABLE engages accurately with specially hobbed wheels housed in control boxes. This combination requires special cable wire that will not take permanent set and will provide smooth, hard bearing surface for cable inside conduit.

NATIONAL-STANDARD engineers made intense microstructural and tensile studies of sample wire to find exact physical properties of the alloy to meet strict aircraft control specifications.

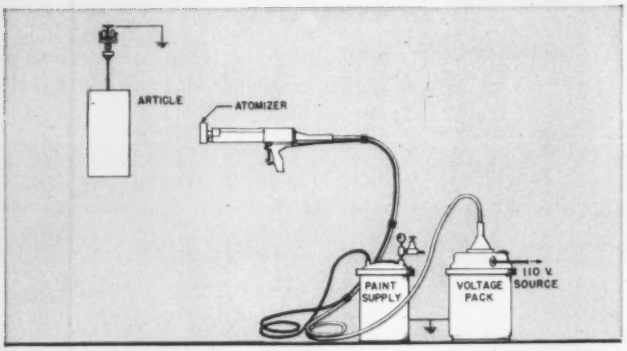
Here it is—

The PAINTING TOOL ALL Industry has been waiting for!

The NEW

RANSBURG

NO. 2 PROCESS ELECTROSTATIC HAND GUN



CUTS PAINTING COSTS!

Saves Paint because there's no waste. Now, for the first time, the high efficiency of Ransburg's No. 2 Process automatic equipment is available to you in the NEW Electrostatic Hand Gun.

Saves Labor, Increases Production because it is faster on many types of articles such as those fabricated from perforated and expanded metals, tubing, rod and wire. This is due to the "wrap-around" nature of electro-spray which paints ALL sides of such articles from one side only.

Saves in Equipment because no conventional spray booth is required—no water-wash, no sludge recovery! Uses no compressed air for atomization.

Saves Building Heat Loss because only mild ventilation for removal of solvent vapors is necessary, and . . .

Maintenance Costs Are Cut because clean-up and maintenance labor is only a fraction of that required by other, less efficient painting methods.

See how YOU can save in your own finishing department, and at the same time, improve the quality of the work. Write for literature and information showing how the Electrostatic Hand Gun has been proven on different products in a variety of industrial plants.

Call or write

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

TARGET DRILLS . . .

ting edges and wear strips. For the deep drilling jobs, Alco engineers have gone to both gun and target drilling, one a single point and the other a trepanning operation.

With the former radial twist drilling method, it was difficult to maintain alignment tolerances in tube sheets more than 9 in. thick because of tool drift.

New machines and tools solved that problem; they hold accuracies of 0.001 in. per foot of depth, and this tolerance (about 20 per cent of former allowances) can be held in depths up to the full 24 in. stroke of the machines. Tools are fed at 6 to 8 in. a minute, nearly three times the former rates.

Both speeds and feeds can be varied, even on the same hole. This permits a machining change when drilling tube sheets clad with stainless steel. Speeds and feeds are reduced for cutting through the cladding and then increased automatically when the mild steel is reached.

• **Programming**—When the operator was using a radial drill on the job, he had to transfer the entire hole pattern from a drawing to the part blank by spotting each hole and calculating any bridges required from a master tube pattern bar jig.

Now the company uses the IBM 650 computer. It was already being used to rate heat exchangers and select the right tube design characteristics for a given application.

The computer section receives the tube layout from design engineering, then figures the input data for the program by feeding the pitch, number of tubes per row, total number of holes, and other pertinent information into the machine. The design engineering department checks the computer input sheets for miscalculation, and a set of check program sheets is completed. Then the IBM input cards are punched, and from them, the computer produces the X and Y coordinates and travel direction for guiding the control system.

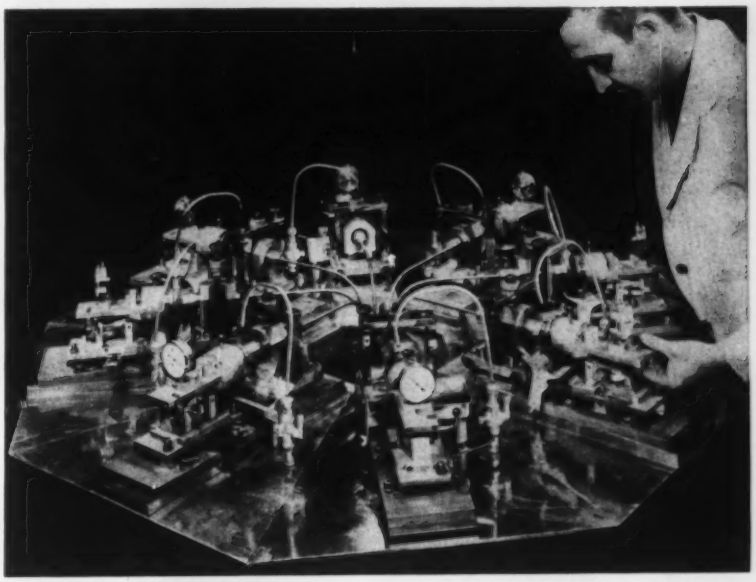
After verification, the control tape is punched on the IBM card-to-tape machine.

The computer calculates 100 hole locations a minute, and the card-to-tape operation spots 160 locations a minute.

Ultrasonic Machine Does Work of Eight Units

FILLING an industry need for an economical, efficient method of machining hard and brittle materials, the Sheffield-Cavitron 8 does the work of eight conventional machines.

The unit has eight horizontal machining stations arranged in a circle on a waist-high table, 4½ ft in diameter. In addition to saving space, the machine costs only about half as much as eight conventional units. Added benefits: Lower operating and maintenance costs (only one electronic generator and one transducer are needed).



The machining stations can be operated simultaneously or independently. Positive workpiece alignment between stations to precisely locate parts to the cutting tool is assured by a combination workpiece and toolholder assembly. Each station accommodates a cutting tool up to 1.08 in. in diameter.

Sheffield extended type, ultrasonic tooling delivers high frequency mechanical energy from the transducer through a curved cylindrical rod to each cutting station. A remote, 1000 watt, electronic generator drives the transducer in a well of the worktable.

Multiple station ultrasonic machines of this type can be arranged for automatic operation, including loading, machining, compensation for tool wear, gaging, and unloading.

For more information, *write* Sheffield Corp., Dayton 1, Ohio.

Gun Drill Eliminates Secondary Operations

THE BOREMATION gun drilling machines produce holes with finishes and size accuracies that make secondary drilling, boring, reaming, and honing operations unnecessary.

Rigidity of construction assures a minimum of vibration and permits a high degree of accuracy in hole alignment. It also extends tool life.

A wide range of feeds and speeds provides the best selection for any particular job. Feed is infinitely adjustable from ½ to 30 ipm. Spindle speed range: 100 to 10,000 rpm.

The machines can be adapted for high production cycle, short hole drilling, maintaining the desired hole tolerances in one pass. With

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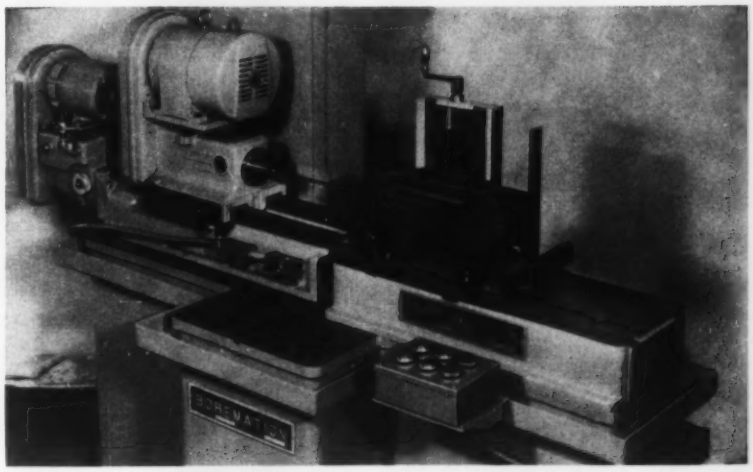
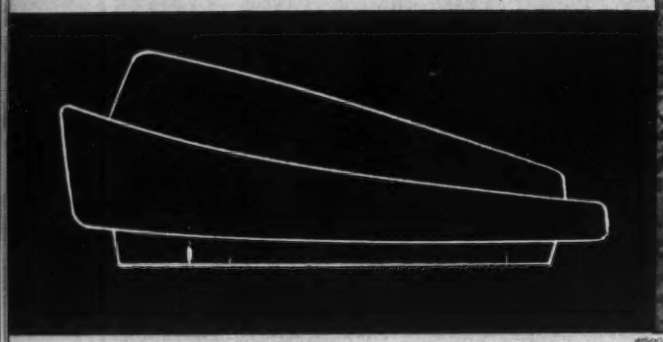
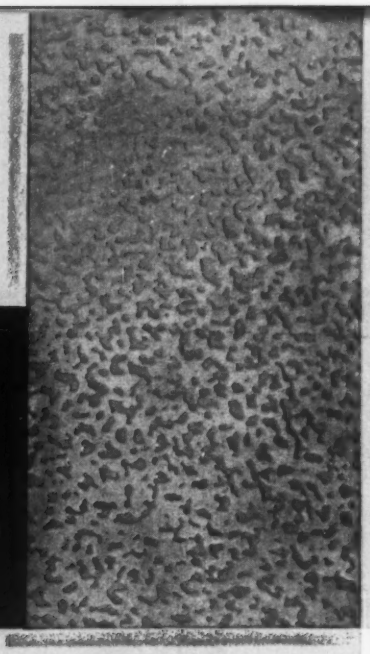
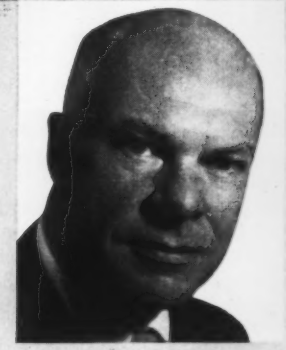






Peter Schladermundt, A.I.A., A.S.I.D., P.D.C., for 25 years a leading designer of many of America's foremost industrial products. Formerly associated with Norman Bel Geddes and other designers and architects on such projects as General Motors "FUTURAMA" and the design of Rockefeller Centre. Presently heading his own firm specializing in all types of design service to industry. Recently designed the Trade Fairs for the United States Government Department of Commerce in Milan and Paris.



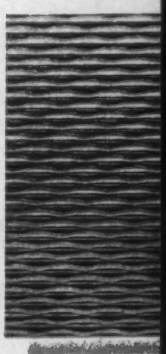
Peter Schladermundt and Sharonart combine for a new design concept..

Tomorrow's business machines will have the low, sleek profile and functional beauty you see in this typewriter design created by the nationally known industrial designer Peter Schladermundt especially for the Sharon Steel Corporation.

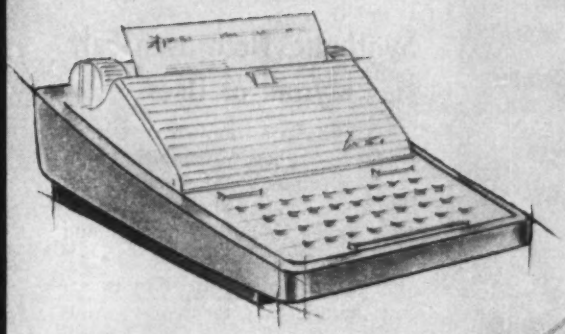
Gone is the bothersome cloth cover and in its stead a regular built-in secretarial workshop that includes typewriter accessory and lighted shorthand book and note compartments. And when the day is through the desk area is made neat by simply dropping the attractive machine lid.

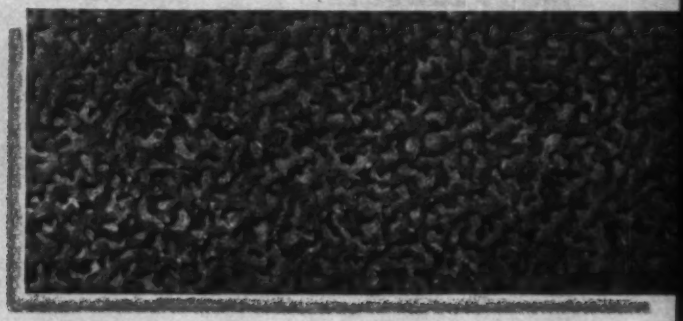
Ingenious? Yes, but perhaps the most important aspect of the design is the functional use of Sharonart, Sharon's popular patterned steel. By fashioning the work areas of Sharonart the usual marks of wear never show, and by forming the cover of this amazing metal many styles are immediately available to the manufacturer by simply changing the pattern . . . and here, too, wear is practically eliminated.

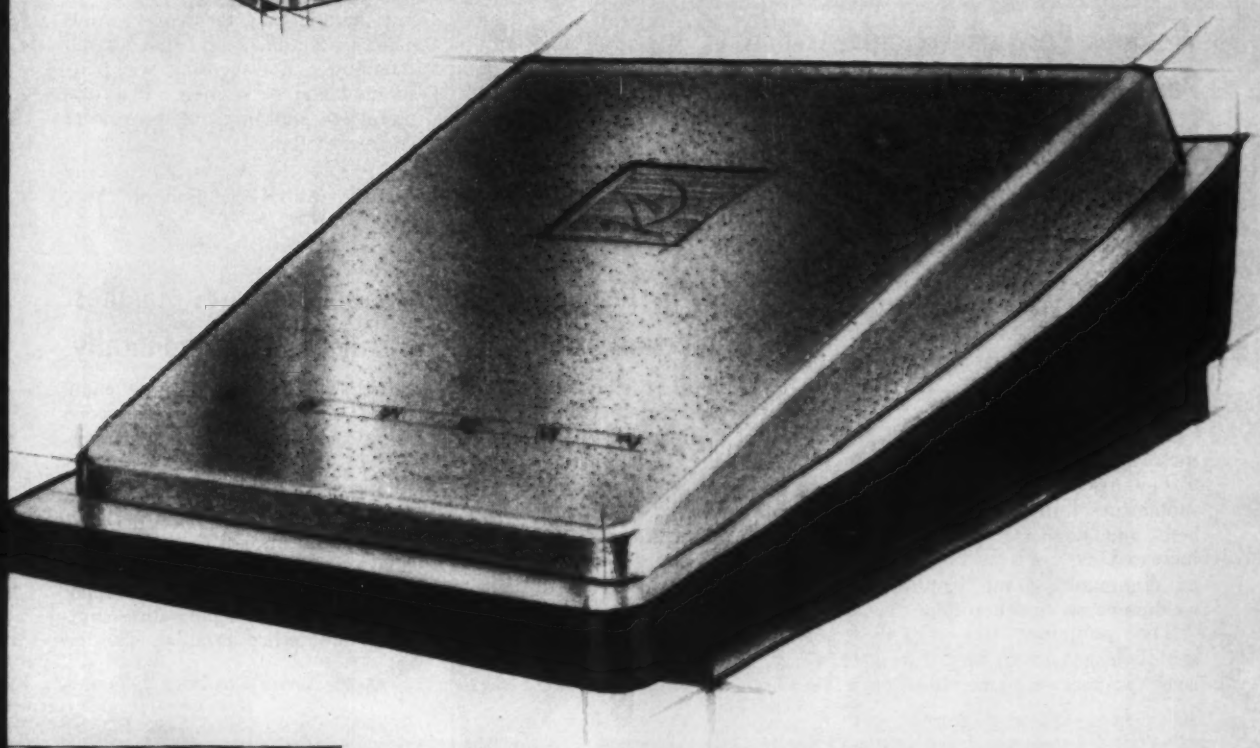
It's the kind of forward thinking that has made Sharonart the most popular material of its kind. Literature and information available from the Sharon salesman in your area or by writing direct to *Sharon Steel Corporation, Sharon Pa.*

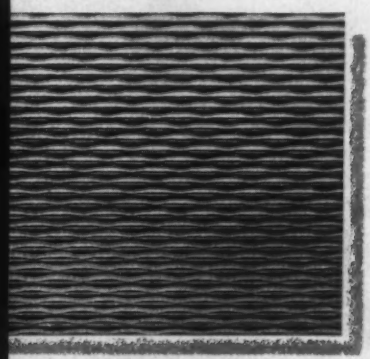


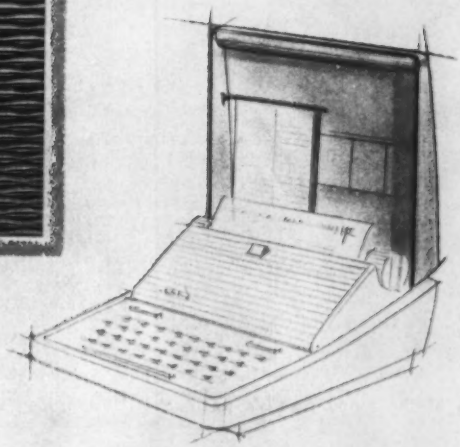
SHARONSTEEL **SHARON** *Quality* **STEEL**

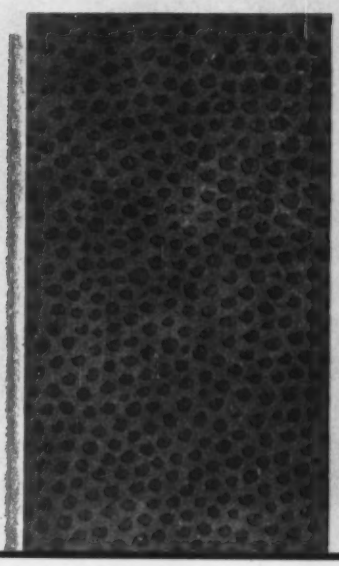












a mechanical stop attachment, hole depths can be repeated within 0.001 in. in most cases with single, dual, or multiple spindles.

Boremation machines are available in two sizes. Model 1200 has a 12 in. stroke and Model 2400 has a 24 in. stroke.

For more information, *write* Drillmation Co. Inc., 6500 E. 11-Mile Rd., Center Line, Mich.

Welding Positioner Holds Parts Weighing 85,000 lb

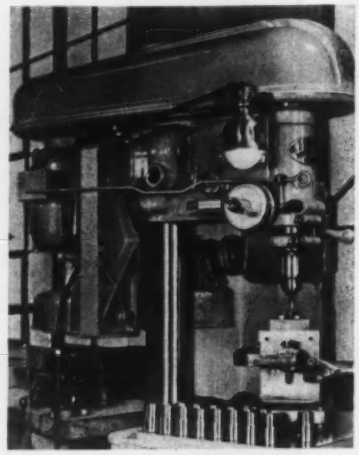
PROVIDING for 90 degrees of forward tilt and 45 degrees of back tilt from the table flat position, this welding positioner affords the greatest amount of accessibility of heavy weldments for manual or automatic welding processes.

Four selective variable speed ranges are standard. Small diameter workpieces can be rotated at 0.40 rpm and large diameters as slow as 0.006 rpm.

The positioners can be used for such irregular shaped weldments as turbine assemblies, heat exchangers, submarine hull sections, furnace bells and hoppers. Production is increased as much as 50 per cent by eliminating crane handling of weldments on the shop floor.

The positioner has a hollow spindle large enough for fixture use, such as recessing the hub of a large gear blank, shaft assemblies, and the passage of gases, hydraulic lines, or cables.

For more information, *write* Aronson Machine Co., Arcade, N. Y.



Walker-Turner drill has 75 models

17 in. Drill Designed For Production Tooling

UNLIMITED production versatility is claimed for a new line of 17 in. Walker-Turner drill presses. Designed for flexible production tooling, the line has more than 75 models to meet various requirements.

Included are floor or bench models with standard or power feed, single or multiple spindles, high or slow speed, standard tilting or production type tables, and ½ in. key chuck or No. 2 Morse taper spindle.

For more information, *write* Dept. 1005, Walker-Turner Div., Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

Synthetic, Nonwoven Felt Has Myriad of Uses

TROYFELT, a nonwoven felt of synthetic fibers, exhibits high strength, dimensional stability, and unusual resistance to abrasion, moisture, temperature extremes, and most acids and alkalis.

Suggested uses: Vibration isolating material for machinery; filter material for oil, water, and air; oil retaining and dispensing wick; insulating and gasketing. It also is useful for polishing dies because of its smooth finish.

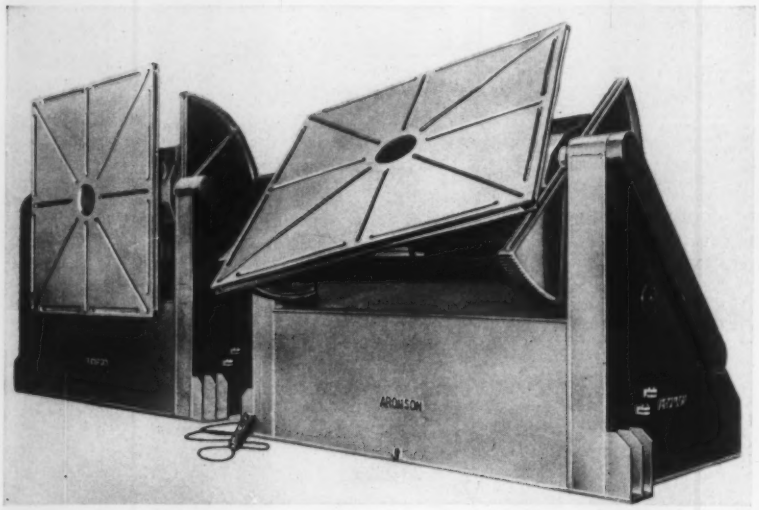
For more information, *write* Troy Blanket Mills, 200 Madison Ave., New York 16, N. Y.

Vapor Degreaser Handles Small Loads Economically

INTENDED for use by production, repair, and similar shops, the Scotsman vapor degreaser is an economical substitute for larger degreasers in handling small workloads.

Though lightweight and portable, it will clean up to 300 lb of steel an hour. It is all electric and requires no installation. A heavy duty vapor control and high temperature shutoff eliminate fire hazards. The im-

(*Please turn to Page* 142)



Aronson welding positioners are shown in two of the many possible positions

Vapor degreaser cleans small loads

Forgings by **KROPP**

18" diameter forged Tractor Sprocket . . . weight 56½ lbs.

■ Metals improved by forging provide highest strength-to-weight ratios, best performance and ultimate economy. Strength and the wear and fatigue resistance that allow massive earthmoving equipment to perform the toughest, most abusive jobs day after day are in-built qualities in Kropp forgings.

Kropp Forge Company's reputation for producing the best in forgings is earned by many years of research, engineering and production by experienced manpower operating modern equipment. For metals at their best . . . forged parts that will give maximum service . . . specify forgings by Kropp.

Kropp

KROPP FORGE COMPANY
5301 W. ROOSEVELT ROAD
CHICAGO 50, ILLINOIS

How

RYKO

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated. Maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

High temperature test for grease. Grease samples are spread on metal strips and placed in 350° F. oven for five days. Only RYKON Grease remained workable at end of test.

N GREASE

has performed in ten tough applications

1

2

3

4

In the metalworking industry, where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new type of grease has been needed. RYKON is that grease. Here are just 10 examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Steel Mill	various	plain and anti-friction	high temperature, heavy load, water, dirt	Outperforms all previously used greases. Less consumption, fewer bearing failures.
Steel Mill	tin line	plain and roller	high temperature, water	Hot caustic water caused other greases to run out and form deposits. RYKON lasts twice as long.
Metalworking	bearings over molten pot	—	high temperature	Temperature reaches 500° F. at times. RYKON stays in longer.
Steel Mill	pit crane, floor crane, charging car	plain and anti-friction	high temperature	Lasts twice as long as some other greases used.
Metalworking	drill head multi-spindle	anti-friction	heavy load	Other greases failed. Running cool on RYKON. No leakage.
Auto Manufacturer	switches on machine tools	—	wet	Good water protection and dielectric strength at a lower cost than previously
Die Caster	die cast machines	various	high temperature	Cut down wear considerably.
Bearing Manufacturer	high speed spindle bearings	anti-friction	high temperature, heavy load	Lasts twice as long as a high priced bearing grease. Does not darken or form varnish.
Steel Fabricator	core oven conveyer	pulley bearings	high temperature and dirt	Works where other greases ran out. RYKON best ever used.
Steel Fabricator	oven conveyer	ball	high temperature	All previous greases caused trolley bearings to stick. RYKON solved problem.

Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test Grease has failed completely.

You expect more from **STANDARD** *and you get it!*

mersion type heater is removable for easy cleanout.

The zinc-coated steel tank has a solvent capacity of 6 gallons. For more information, *write* Phillips Mfg. Co., 3475 Touhy Ave., Chicago 45, Ill.

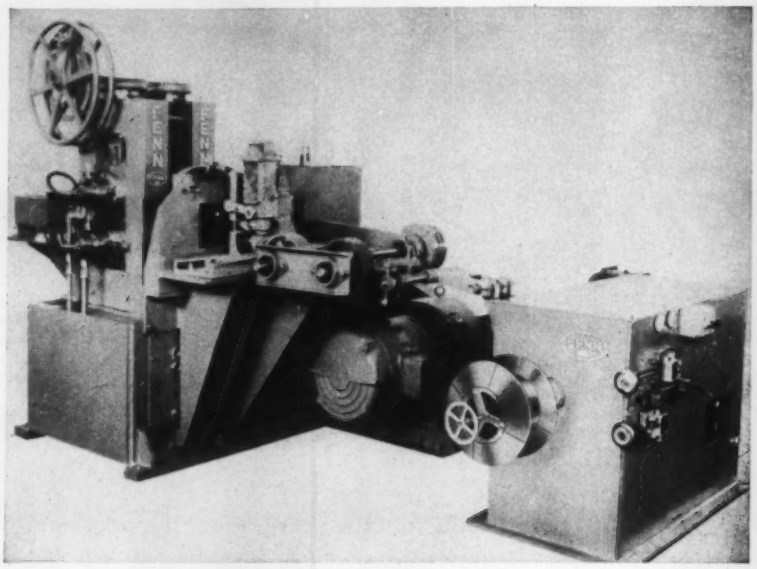
Compact Mill Flattens, Sizes Wire at 600 fpm

IF YOU USE flat wire in your manufacturing, you can put in your own wire line to do the finishing operations with minimum investment and space requirements.

The Fenn 5-in-1 line draws, flattens, edges, sizes, shapes, electronically gages, and accurately coils up to $\frac{3}{8}$ in. diameter wire at production speeds up to 600 fpm.

The wire stock is drawn to size through carbide dies and then flattened in an 8 in. mill equipped with carbide shell rolls. Sizing and edging are done in a Fenn turk's-head. The flat wire is gaged for thickness with a Pratt & Whitney electrolimit gage. A hydraulic traversing take-up reel coils the wire.

Price of the line is under $35,000. The manufacturer promises delivery in ten weeks. For more information, *write* Fenn Mfg. Co., Newington, Conn.



Fenn Mfg. Co.'s wire mill turns out flat wire at speeds up to 600 fpm

Drill Unit Generates Own Hydraulic Power

THE BORIZER, a self-contained unit for rotating and feeding single or multiple tools, can provide economical multiple tooling in automated or special setups in a wide variety of applications.

The compact unit generates its own hydraulic power. It can be used singly or in groups for drilling, reaming, counterboring, chamfering, plunge facing, and similar operations. With supported guide bushings, it can also do precision boring with a single or multiple tool quill.

For more information, *write* Heald Machine Co., 7 New Bond St., Worcester 6, Mass.

Inspection Fixture Has Sine Bar, Angle Vernier

THE SORENSEN Roto-Mike gives the tool and die maker, and the inspector a fast and accurate instrument for general layout work and angle measurement.

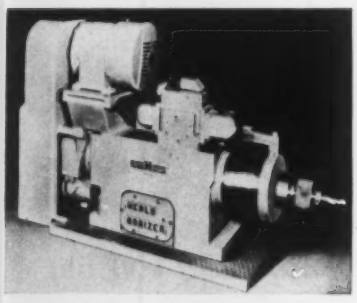
Workpieces mounted on the faceplate may be rotated quickly and precisely through any series of concentric angle settings by reference to the sine-vernier measuring ring.

An important advantage is gained by the independent faceplate which may be rotated and adjusted separately from the measuring ring, and then locked to any relative setting. This allows the work to be zeroed in at any starting position. The operator smoothly levels the work with the fine adjustment, instead of jarring it into relationship with the measuring element during setup.

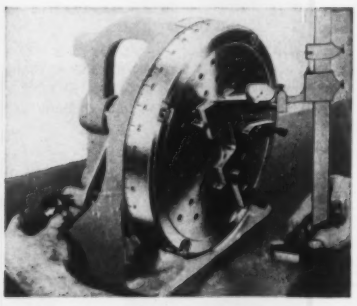
For more information, *write* Sorensen Center-Mikes Inc., 264 Kossuth St., Bridgeport, Conn.

Automatic Press Feeder Handles 8x12 ft Plates

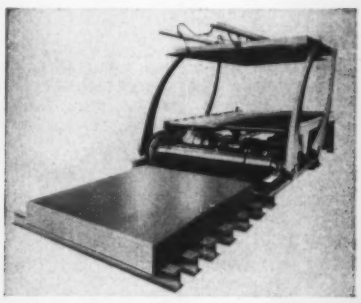
SHEETS and plates up to 8 x 12 ft, weighing 600 lb, can be handled



Borizer generates its own power



Roto-Mike is useful inspection tool



Herr Press feeder handles plates

EATON-RELIANCE cost-reducing fasteners do the job easier, faster, surer

When you choose industrial fasteners for any type job, you look first for two things—QUALITY and PRICE. Eaton fasteners give you both. Eaton quality is the result of many years' experience, high engineering standards and an efficient quality control system. Eaton also gives you production and service geared to your schedules. The Eaton price is low—consistent with high quality—because machinery is modern, employees are skilled, and the raw steel is cold drawn, cold rolled and heat treated to rigid specifications.

Eaton-Reliance Industrial Fasteners are truly fasteners to be relied on. Design and industrial engineers in major fast-moving industries such as automotive, farm implement, construction machinery, appliance —to mention a few—call for Eaton quality fasteners on many varied types of assemblies.

An examination of our complete line, described in Engineering Bulletin 4K/3, will show you the wide range of types available and give you fresh ideas on cutting your fastener costs; send for a copy today, or request one of our industrial fastener engineers to call. There is no obligation.

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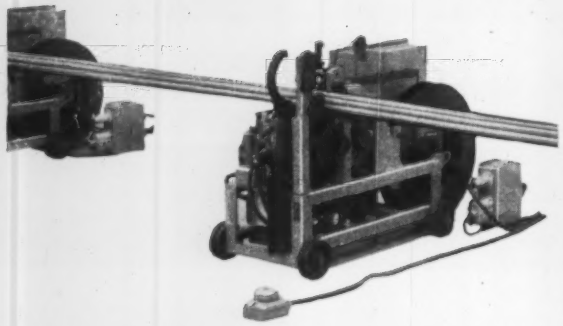
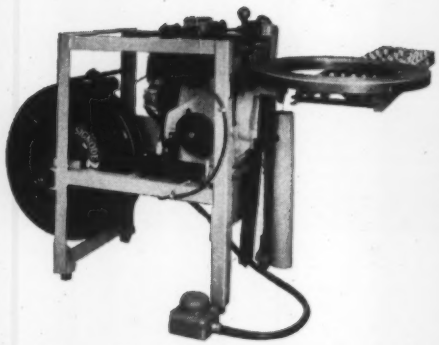
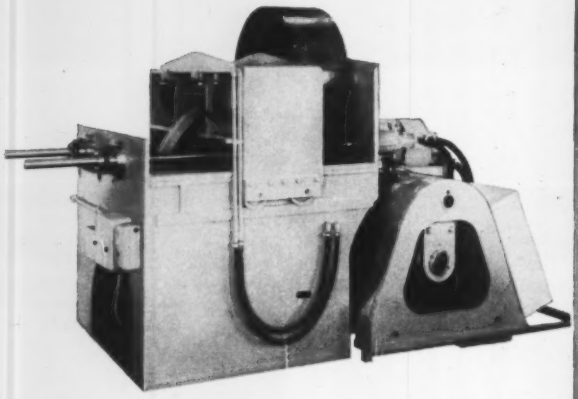


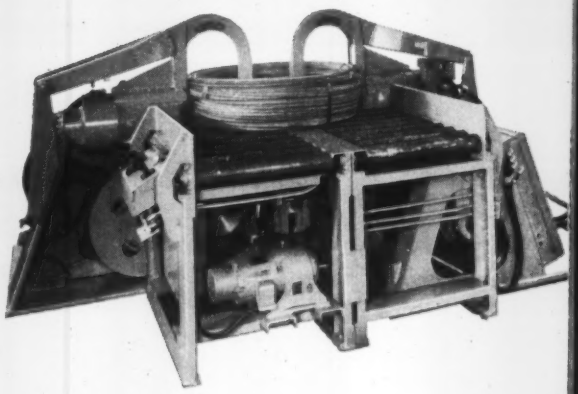
Signode MS2-B automatic strapping machines are used to bundle conduit, rods, tubing, and small dimension pipe. Usually two or three of these machines are used in line and operated from one control to apply two or three straps simultaneously. MS2-B automatic strapping machines can be adapted to handle and strap bundles of various shapes and sizes. Strapping operation is completed in four seconds.



The M2V machine straps narrow strip coils from ¼" to 2" wide. Each strap is applied in approximately 1½ seconds. Automatic and semi-automatic machines of the M2 series have been in steel mill operation since 1946, strapping conduit, rods, tubing, pipes, strip coils, mine roof bolts, and nail cartons.

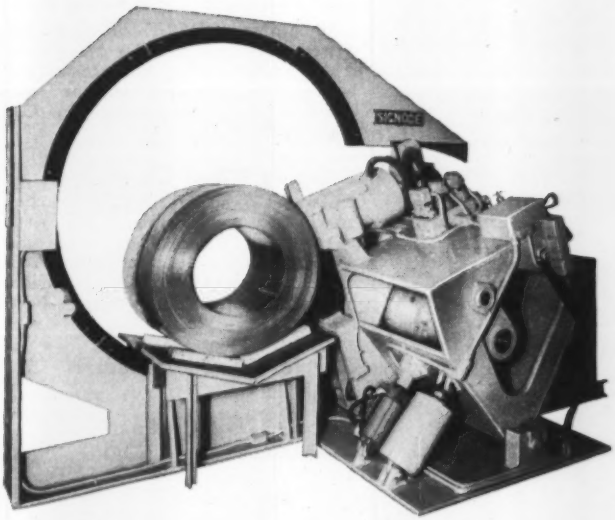


This MH10 series strip coil strapping machine will strap up to 120 coils per hour, three straps per coil. At the touch of a button, the machine tightens outer loops of the coil, squares up edges, positions the coil, and applies the strap to a pre-determined tension of up to 1200 pounds. Similar Signode machines have been in steel mill service since 1948...perform as well on hot coils—1200°F.



This dual automatic MH11 series strapping machine straps rod or wire coils up to 60" O.D. at 110 coils per hour. Machine applies single strap or applies two straps at once. Proper preset tension on every strap makes coils more compact, easier to handle, take less space. Signode wire coil strapping machines have been in steel mill service since 1949.

dependable steel mills



The Signode MH14-34 circumferential strapping machine is a relatively recent development. It automatically, and without adjustment for size, center-straps coils of from 30″ to 60″ O.D. Capacity is 300 to 400 coils per hour, depending on size. Coils can move through the machine in either direction.

SIGNODE machines reduce strapping and handling costs

The high cost of down-time in a steel mill puts a premium on machine dependability. Signode steel strapping machines have proved dependable—and productive—in 73 mills, some since 1946, in the hardest kind of service. Today's rising steel production gives additional importance to the savings these dependable machines deliver. Look to Signode for strapping machines built to steel mill standards.

First in steel strapping

SIGNODE STEEL STRAPPING CO.

2645 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

by a new Herr machine. They can be picked up, aligned, and fed automatically into shearing, forming, or blanking presses.

Eliminated are the costly and dangerous practices of prying plates loose from a stack manually, attaching hooks or grabs, and feeding the plate into a press from a roller table. Gang operation is obsoleted; one man can do the entire job quickly.

The equipment has a table of I-beams, mounted transversely, and provided with adjustable side guides on which the stack of plates or sheets is loaded. Four pivoting arms, mounted in pairs, support a vacuum lifting mechanism which picks up one piece at a time and carries it to the driven roll feed table. Side guide rollers on the feed table align the plate with the press dies.

For more information, *write* Herr Equipment Corp., Warren, Ohio.

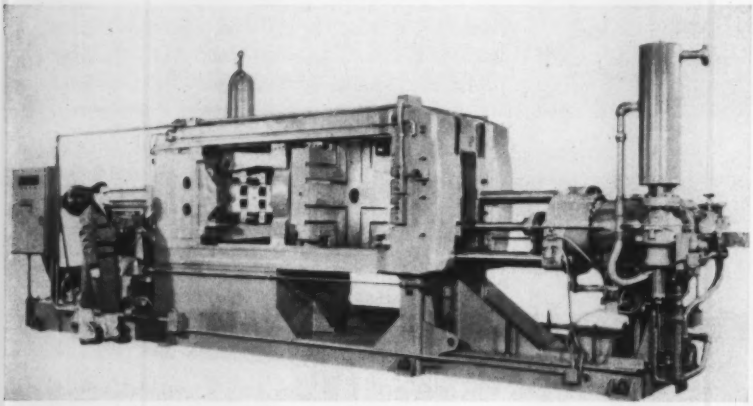
Anodizing Rack System Minimizes Replacements

WITH these all-titanium racks, anodizers no longer have to junk or rebuild expensive anodizing racks because of style or design change in parts.

The new racks can be instantly revised to accommodate wide variations in sizes and shapes of parts. Adjustment is continuous from 0.001 to 32 in.

Rapid changeovers are made with a rigid titanium spline and disc-type titanium workholders fitted with integral clamps. The workholders can be positively positioned at any location on the spline.

Complete titanium construction requires no coating, assures longest possible rack life, and eliminates stripping. For more information, *write* Anodizing Rack Div., Service Screw Products Co., 133A N. Green St., Chicago 7, Ill.



Lester-Phoenix aluminum diecaster has 1000 tons of preload clamping force

Diecasting Machine Makes 40 lb Parts

PARTS like gas meter housings, motor blocks for outboard motors, and street lighting housings can be cast on the Lester-Phoenix 1000 ton aluminum diecasting machine.

The unit has the Lester prefill injection system which provides high initial speed with high final impact. It produces superdense aluminum castings with a fine surface finish.

The 1000 tons of preload clamping is made possible by a one-piece alloy steel frame and beam area. The frame also insures permanent, parallel alignment of the platens. The movable platen, completely unobstructed, is 60 in. wide, with a vertical clearance between the beams of 60 in.

Designated the HP-3½X-40C-SF, the machine can produce castings up to 40 lb.

For more information, *write* Dept. N-2, Lester-Phoenix Inc., 2711 Church Ave., Cleveland 13, Ohio.

NEW literature

Write directly to the company for a copy

Product Information File

A folder contains specifications of a variety of building block type automation machines for mechanizing and integrating production and assembly operations. Industrial & Automation Div., Radio Corp. of America, 12605 Arnold Ave., Detroit 39, Mich.

Belt Conveyor Engineering Data

An 88 page catalog (ID-591) shows belt conveyor products, including heavy duty, standard roller bearing, and precision ball bearing idlers. Materials Handling Dept., Industrial Div., Continental Gin Co., Birmingham 2, Ala.

Grinding Wheel Chart

Ten "Dos" and "Don'ts" of grinding wheel safety are listed on a wall chart for toolrooms, cribs, bulletin boards, and near grinding machines. Advertising Distribution Section, Carborundum Co., Building W-5, Walmore Road, Niagara Falls, N. Y.

Carbide Tools and Inserts

Catalog, No. A-102, gives performance data on regular low cost and premium grades of carbide tools, tips, inserts and blanks, and information on special shapes and wear parts. Unimet Carbides, 435 W. Ontario St., Chicago 10, Ill.

Mechanical Charging Equipment

"Mechanical Charging Systems," a 28-page booklet, gives the foundryman a rundown on the complete roster of equipment prescribed for an up-to-date melting department. FY-179. Whiting Corp., 157th Street and Lathrop Avenue, Harvey, Ill.

Yard and Factory Trailers

Catalog B describes a cross section of heavy duty custom built trailers with capacities ranging from 6 to 100 tons. Easton Car & Construction Co., Easton, Pa.

Tape Controlled Machines

A 12-page bulletin describes tape controlled, Burgmaster, 6 and 8 spindle turret drilling, tapping, and boring machines. Burg Mfg. Co., Inc., 15001 S. Figueroa St., Gardena, Calif.

Phosnic Bronze Data

A booklet describes the various forms, tempers, and properties of phosnic bronze, as well as its composition and some typical uses. Chase Brass & Copper Co., Waterbury 20, Conn.

Data on Soldering Aluminum

A reference booklet gives data on soldering fluxes, irons, flames, and soldering methods. Dept. PRD-6, Reynolds Metals Co., Box 2346, Richmond 18, Va.

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Summer or winter the car with plenty of Stainless Steel
is easy to clean and keeps its good looks
under the roughest conditions of driving and weather.

No other metal offers the freedom of design and fabrication,
economy of care and the durable beauty that serves
and sells like Stainless Steel.

McLOUTH STEEL CORPORATION, Detroit 17, Michigan

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for automobiles

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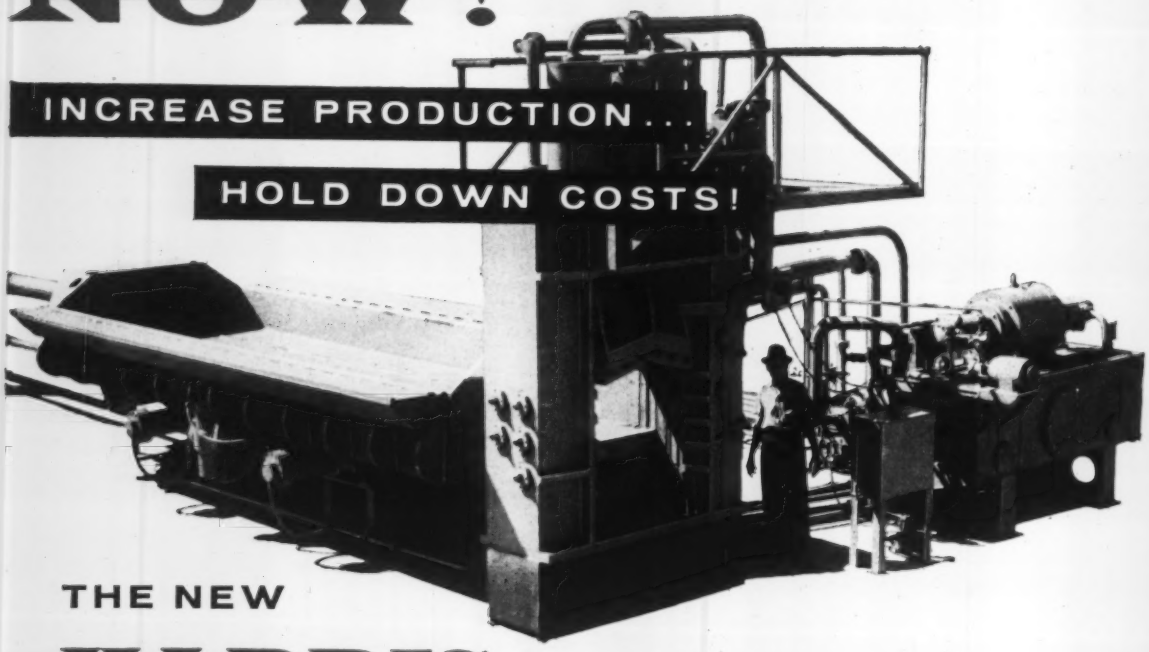
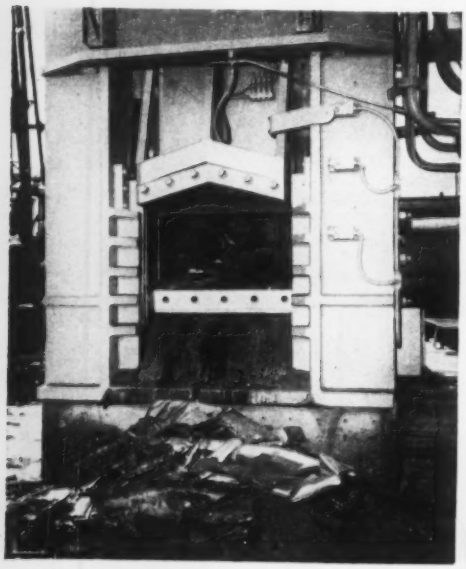
HOLD DOWN COSTS!



THE NEW

HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

▶ *Talk with a Man from Harris*

March 23, 1959

Market Has Strength Across the Board

ALTHOUGH they're under heavy pressure to produce and ship everything on their books by June 30, steelmakers have few complaints. Their production problems are at a minimum because of the market's diversified strength.

Demand for light and heavy products is well balanced and closely attuned to the industry finishing capacity. In other years, mills have been taxed to the limit by sudden spurts in single markets: Automakers have wanted more sheets than they could produce; builders have called for more structurals or plates than they could turn out; or oil producers have demanded more drill pipe, tubing, and casing than they could furnish.

This year, the major markets are recovering simultaneously and inventories are universally low. Sheets aren't being produced at the expense of bars, tubes, or plates. Men and machines aren't working around the clock in some departments while costly facilities in others remain idle. Demand is so widespread that, if automakers decided to cut back their orders for sheets, producers could ship the canceled tonnage to a host of other consumers.

DEMAND SUSTAINED—Sales executives thought for a while that incoming orders might taper off after buyers had put some steel on their shelves. Now it's apparent that there will be no letup before June 30. Consumers underestimated their needs and have made little headway in building strike hedge inventories. Mills continue to book more tonnage than they're shipping. Jones & Laughlin Steel Corp.'s backlog, the biggest in company history, is still growing. Orders received by Allegheny Ludlum Steel Corp. in January and February came in at a record pace, assuring capacity operations for most of the first half in some product lines.

AUTO SALES IMPROVE—The auto industry, steel's biggest customer (it took 24 per cent of domestic shipments in January) is selling cars at an annual rate of 5.1 million (vs. 4.3 million last year). Seasonal gains were noted in the first third of March as retail deliveries averaged 16,645 a day. Sales were 4 per cent ahead of February's early pace and 23 per cent better than those of the corresponding period in 1958.

STAINLESS BRIGHTENS—Improved demand for stainless steel will mean capacity operations at most mills during the second quarter. Automotive suppliers hope to have a 60 to 75 day inventory by July 1. Appliance makers aren't going out beyond 45 days because that's about as much carbon steel as they'll be able to obtain.

TIN PLATE SHINES—Electrolytic tinning lines are running full as producers get set for another banner year. Order books for April and May will soon be closed, and mills have commitments for June. Shipments are about the same as they were a year ago, but releases will have to be speeded up if consumers hope to increase their inventories. (Can companies want to hedge against a midyear steel strike by adding a 30 to 60 day surplus to their stocks.) Steelmakers warn that freight car shortages may delay shipments.

PRODUCTION LEVELS OFF—Last week, steelmakers operated at 92.5 per cent of capacity. Production was about 2,619,000 net tons of steel for ingots and castings.

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*Current prices were published in the Mar. 9 issue and will appear in subsequent issues.

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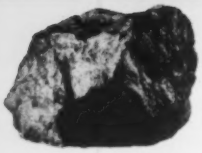

. . . use Vancoram Grainal Alloys! They improve the physical properties of high-strength steels, and are also useful as final deoxidizers. As additives to stainless and heat-resistant steels, Grainal Alloys improve hot-working characteristics and reduce rejections and conditioning costs. You can also count on Grainal to improve performance of tool and die steels.

Remember this: Grainal Alloys effect savings by reducing alloy requirements and by cutting fabricating costs; and there are many reasons why these alloys are useful in deep hardening and carburizing steels. For complete information, write for the free booklet. "Grainal and Its Use." Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. • Chicago • Cleveland • Detroit • Pittsburgh

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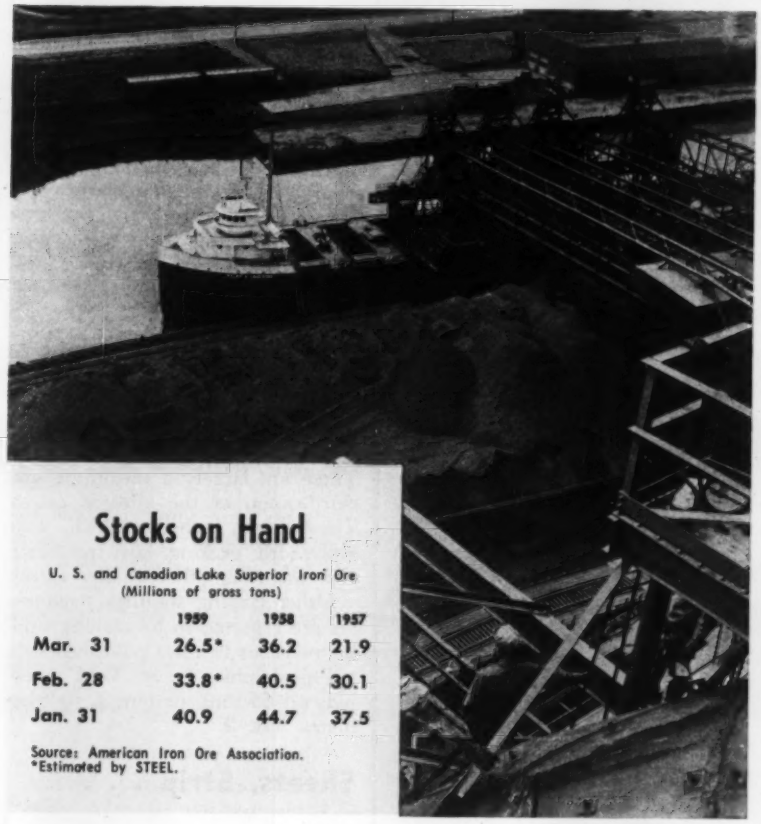

U. S. Steel Corp.

Stocks on Hand

U. S. and Canadian Lake Superior Iron Ore
(Millions of gross tons)

	1959	1958	1957
Mar. 31	26.5*	36.2	21.9
Feb. 28	33.8*	40.5	30.1
Jan. 31	40.9	44.7	37.5

Source: American Iron Ore Association.
*Estimated by STEEL.

Weather, Steel Strike Worry Lake Ore Carriers

THE IRON ORE picture is clouded by two "ifs": The weather and the possibility of a steel strike.

The worst ice conditions on the upper Great Lakes in many years are expected to delay the shipping season. A weather bureau spokesman estimates port openings will be seven to ten days late, maybe more. The key rests in the last two weeks of March. In 1958, the first vessel cruised up the St. Marys River into Lake Superior on Apr. 17.

Shippers had hoped to steam out early in April this year. Increased activity at the mills and stockpiling in anticipation of a steel strike promise a brisk spring and early summer for the carriers. "Everybody will be hustling like a house afire until July 1 when the steelworkers' contract expires," reports an ore firm official.

Prognosticators say 70 million to 75 million tons of ore will travel the fresh water route this year. That's well above last year's 20-year low of 53 million tons.

• **Stocks**—Despite the delay in shipping operations, stocks are generally considered adequate to carry the mills until ore is sailing smoothly again.

However, the stoppage of transport by a steel strike creates some apprehensions. Several sources feel an ore shortage may develop next spring if the strike materializes. Other respondents have no such fears. Still others think that the length of the strike will determine any shortages that may occur.

• **Ships Readied**—About 225 of the lake fleet's 250 vessels are expected to operate in 1959. That's quite a jump from last year when operations were below 73 per cent at the peak of the season and fell as low as 59 per cent.

Pittsburgh Steamship Div., U. S. Steel Corp., largest of the lake transporters, will run 53 of its 57 ships this year. Running at full power will be Wilson Marine Transit Co. (18); M. A. Hanna Co. (ten); Lake Fleet Div., Republic Steel Corp. (nine); and Inland Steel Co. (five). Hutchinson & Co. expects to have 22 of its 25 vessels on the lakes. Cleveland-Cliffs Iron Co. says it will operate 14 of 16 carriers. Other firms will announce plans shortly when the weather situation and tonnage demands are clearer.

• **Imports**—Imported ores are continuing to capture a larger share of the American market. Canada and Venezuela are the prime beneficiaries. Several companies will have ships plying the St. Lawrence Seaway, bringing ore down from the increasingly important Labrador Trough.

Iron Ore . . .

Iron Ore Prices, Page 166

Japanese steel interests have negotiated purchase of additional British Columbia iron ore tonnage. Nimpkish Iron Mines Ltd., with holdings on Northern Vancouver Island, plans initial shipments to the Orient in midsummer. The company is said to have proved about 1 million tons of ore and is extending its exploration program.

This latest purchase is the third by Japanese importers of British Columbia ore.

Since 1952, Texada Mines Ltd. has shipped more than 1.5 million tons of ore from Texada Island, Gulf of Georgia, and other properties in the area are also shipping to the Far East.

Steep Rock Mines plans to increase production progressively toward an objective of 5,500,000 tons annually of high grade ores from its directly operated mines. At the Caland Mine, leased to Inland Steel Co., the development program has been rapidly executed, and this mine will start shipping in 1960.

The company's expansion program, curtailed in 1958, has been resumed, the cutback not having caused any significant delay in its long range planning. The two gravity ore-cleaning plants built in 1958 will be in production this season. These will produce increased quantities of "tailored" ores which Steep Rock introduced last year. They process, in part, material hitherto waste and mined from areas outside the limits of the ore bodies proper.

Stainless Steel . . .

Stainless Steel Prices, Page 164

Lower prices on stainless steel (type 348) cold-rolled strip, sheets, plates, bars, structurals, hot-rolled rods in coils, wire ½ in. and under, and forging billets, are shown in Republic Steel Corp.'s latest stainless price card (dated Feb. 24). Prices on all other grades are unchanged. The new prices, cents per pound:

Product (Type 348)	New Price	Old Price	Change
CR Strip	79.25	86.75	—7.50
Sheets	79.25	86.75	—7.50
Bars & Structurals	64.25	74.75	—7.50
HR Rods in coils	63.75	71.00	—7.25
Wire ½ in. and under	63.75	71.00	—7.25
Forging Billets	57.75	63.75	—6.00

In addition, Republic has issued revised extra slips on stainless strip, sheets, plates, bars, billets, wire rods, incorporating changes that have been made over recent months. These are largely a rewording and clarification of the affected extras. They chiefly concern finish, gage and width, packing, heat treatment, and the Magnaflux quality extras.

Other leading stainless steelmakers are reported to be making similar revisions in their published lists.

Philadelphia Navy Yard opens bids on 65 tons, pattern B stainless plates Apr. 2.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 161 & 162

Sheetmakers are running behind on commitments for hot and cold rolled and galvanized sheets. They are turning away substantial new tonnage, though some sellers think consumers are not building up their inventories as much as they would like as a hedge against a strike. That's because improved business is increasing consumption, a smaller proportion of steel receipts going into inventory, and, also, because mill deliveries are slower than they were.

Some mills suspect there will be some cancellations, or pushbacks, for steel from some consumers before the second quarter is over. Most likely the auto industry will. But it's felt the tendency from here on will be for order carryovers to build up—though, currently, the mills have no problems on that score, except for special products.

Congestion—Truck loading docks are congested at some mills; there's little chance for early improvement. In the Chicago market, increasing tonnage is being moved by barge. Consumers like that form of transport, and specify it when it's feasible.

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Sheet specialties are in strong demand, although the situation in electrical sheets is mixed. Some producers are scheduled well ahead, while others have poor order books.

Sellers of mill edge hot strip are not pressing hard for business, especially where semifinished steel supply problems are encountered. This is a market that has been going increasingly to "strippers" over recent years, with the direct mill potential less promising.

See No Letup — Even though Pittsburgh district mills have been producing and shipping at capacity for some weeks, demand remains strong. Sales executives once believed that buyers might relax after they had put some steel on their shelves. Now it's apparent there will be no letdown before June 30. Consumers underestimated their needs, and have made litttle headway in building strike hedge inventories.

Steel Bars . . .

Bar Prices, Page 160

Demand for merchant bars is showing decided improvement. Requirements are expanding in hot carbon grades and cold drawn and alloy specifications.

One maker attributes the improvement to automotive needs, which he described as "active." Another, reporting heavy buying, is sold out for the second quarter. Even tool steel bars, which had been noticeably slow, have picked up considerably.

While the hot mills are not fully booked for the second quarter, they're not concerned about getting all the tonnage they can handle in the period. Certain mills, selling other major products as well as bars, are so heavily booked in some items (sheets, for instance) that the allotment of semifinished steel for various requirements has become a problem.

Pressing for larger tonnage are railroads and fastener manufacturers. One large fastener maker has raised his second quarter needs twice. Reflecting the growing diversity of demand, warehouses are increasing their specifications.

Demand for cold-finished bars is strong, but indications are that automotive suppliers may "pull in their horns" before the end of the first half. One Pittsburgh area mill reports it has received hold orders from a customer that apparently overbought and now asks that May tonnage be delivered in June.

By scheduling capacity operations, cold drawers hope to meet their delivery commitments this month. They may have to carry over some tonnage into April, and it's more than likely shipments will pile up next month.

Distributors . . .

Steel service centers note a pick-up in business and believe it may develop into substantial volume. Many are wondering if the inventories they had planned to carry will be adequate to meet consumers' demands.

Sheets are the most active. Bookings in plates, structurals, and bars have increased. Spokesmen for the industry predict that when mill deliveries hit an eight to ten week

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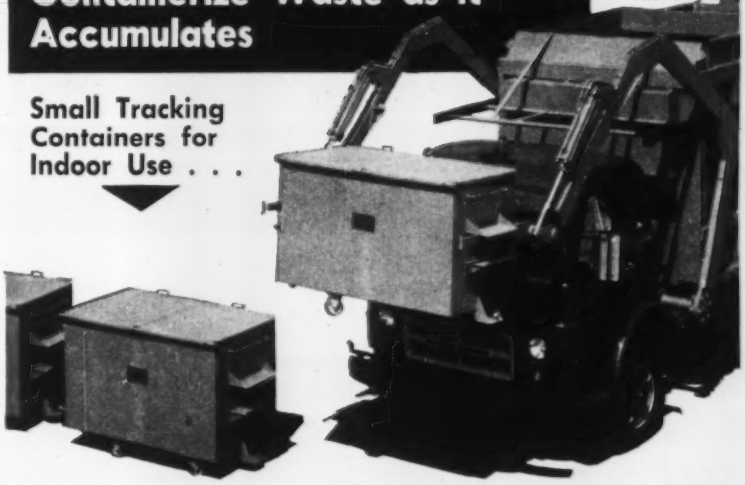
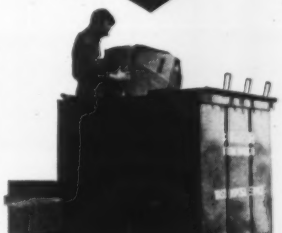


Large Containers for Outside Use



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cycle, steel service center business will show a sharp upturn. Up to now they feel that bulk of the increased demand is attributable to hedging against a strike and that consumers aren't concerned enought to drift away from mill sources.

Some observers feel the service centers will wind up the year with sales 25 to 35 per cent above 1958's.

Wire . . .

Wire Prices, Pages 162 & 163

Business is improving, but producers can give relatively quick deliveries (one to two weeks) on most products. A sharp seasonal pickup is expected in merchant products, and further gains are anticipated in manufacturers' wire orders as consumers step up protective buying against a midyear steel strike.

Wiremakers are deeply concerned over imports. They think the situation is worsening. Example: A year ago, imported nails sold for an average of $1 less than domestic nails. Today, the differential has broadened to $2. Sellers see no early correction, though reports from Texas indicate that prices on imported steel products there are being raised.

Marine requirements for wire rope are heavier. General Stores Supply Office, Navy, Philadelphia, closes Mar. 30 on 585,950 ft.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 156

Highway construction and other public works offer large potential demand for reinforcing steel in the months immediately ahead. The seasonal upturn in buying is starting, and producers are building up sizable order backlogs of reinforcing bars and wire mesh. One seller on the West Coast reports its order backlog is twice as large as it was at this time a year ago.

Orders for bars are slightly heavier in New England. (They're mostly for bridges.) Prices at the distributor-fabricator level in that area are highly competitive.

Demand for paving mesh is practically unchanged, and there's still no evidence that it's being inventoried. But about 1000 tons are being placed through contractors for Connecticut jobs.

Construction cable is moving in

fairly good volume. It is being stocked by makers.

Foundations for the Prudential Center, Boston, are out for estimates. Several thousand tons of reinforcing steel are involved.

Importers of steel are upgrading prices on products shipped into the Texas market. One example is rebars. The base price has been raised from $4.50 to $4.91.

The movement of reinforcing bars from fabricating shops to job sites has improved more than seasonally within the last two weeks.

Rails, Cars . . .

Track Material Prices, Page 163

Railroads are showing a little more disposition to purchase rolling stock and other equipment. If freight car orders materialize, steelmakers will be hard put to get the necessary tonnages of plates, structurals, and heavy sheets into their already jammed rolling schedules. Railroad car orders show a sharp improvement over those a year ago, but the total is still relatively small.

Tool Steel . . .

Tool Steel Prices, Page 164

A Pittsburgh producer of tool steels has experienced a bigger increase in demand than "it bargained for." And not all the new business coming is scare buying. Customers' inventories were abnormally low when business started to improve, and the combination of better demand and strike hedging has given the market a noticeable bulge.

Many shipment requests are for late May and early June. As a result, deliveries are being extended three or four weeks, and it will be harder for makers to keep their shipment promises the closer they come to June 30.

Another producer has more business booked for March and April than it has for May and June. Says a sales official: "We were out looking for orders a little earlier than some of our competitors. We expected a squeeze, so we tried to protect our customers by getting them on our books before the scramble began."

Items in strongest demand are the alloy tool steels, and hot work steels. The third quarter will be relatively slow, even if a strike is averted, but

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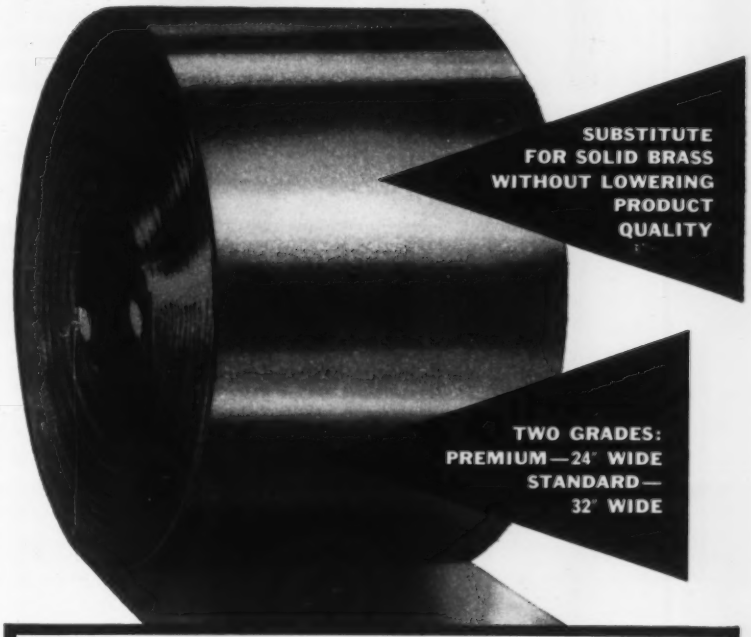

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producers think volume will better that in the like period last year.

Tubular Goods . . .

Tubular Goods Prices, Page 164

Line pipe producers are fully committed for the first half. Their books have been closed for about two weeks. While they're assured of capacity operations through June, it's unlikely they'll set a shipping record. Reason: The first two months of the year were relatively slow.

Demand for drill pipe and other oil country items has picked up markedly. Tubing 2⅜ and 2⅞ in. in diameter is especially hard to get. Some makers are sold out for the first half, but others are still taking orders for May.

In ceremonies at Houston marking completion of Youngstown Sheet & Tube Co.'s $3 million expansion program at its Continental-Emsco Co. Div., Chairman J. L. Mauthe said oilmen are making "terrific" additions to previously low inventories of oil field equipment and supplies. He said he had never seen such a rush by steel and equipment makers to turn out oil country goods.

Texas steelmen say the government's decision to impose mandatory controls on oil imports will result in the rig count improving after the oil industry is in position to gage effect of the new controls.

Standard steel pipe demand is improving seasonally. Some makers are operating above 75 per cent of capacity, but they can still ship buttweld from stock. In some sizes of seamless pipe, delivery promises average about six weeks. A month ago, producers could give overnight shipments. Miscellaneous seamless tubing is tight, with deliveries running into late April.

Jobbers and contractors are adding to their stocks of standard pipe.

Plates . . .

Plate Prices, Page 160

Leading plate sellers have opened order books for third quarter tonnage. But the action is not universal—at least not formally. In some cases the mills are discouraging the placing of tonnage for that delivery position, though they are not turning down such orders.

Practically all makers are booked full for the second quarter on the basis of specified tonnage and set-asides but it doesn't prevent consumers from trying to get more tonnage for shipment before the end of June, particularly the railroads. Many have extensive carbuilding and car repair programs scheduled for their own shops. They need tonnage critically, since they entered the market belatedly.

Consumers are concerned about possible shortages this summer, and they anticipate higher prices as result of new labor agreements. Pipe line fabricators also are seeking substantial tonnage for delivery before June 30. And building requirements are rising seasonally; shipwork is well sustained. Requirements for machinery and heavy industrial equipment still lag, though minor improvement is noted.

Jones & Laughlin Steel Corp., Pittsburgh, last week announced its Jalloy, grade 3 alloy plates (heat treated, abrasion resistant) are available in four hardness ranges. Molybdenum-bearing Jalloy will now contain copper as standard practice to provide additonal resistance to atmospheric conditions.

Jalloy plates are distributed primarily through warehouses. The new hardness ranges make it possible for the steel service centers to stock grades for end-use applications.

Structural Shapes . . .

Structural Shape Prices, Page 160

Structural jobs are increasing in the Midwest. Recently, district fabricators started placing heavier steel orders with the mills although their plants were operating only four days a week. The heavier buying largely reflected hedging against a possible strike-induced shortage this summer. But business is picking up, and more steel will be needed before June 30 than had been thought. Competition for jobs is keen.

New England fabricators also are placing heavier orders with the mills. The bulk of tonnage being figured in the district is for bridges (stringer and rolled beam structures); on this type work, tonnage requirements can be estimated.

Wide flange volume is moving a little more actively with fabricators alerting contractors to place their steel requirements without delay to enable fabricating shops to cover on plain material needs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5000 tons, 34-story office building, Uris Bros., Park Ave., between 51st and 52nd Streets, New York, to Harris Structural Steel Co., New York.

2610 tons, Columbia Law School, Amsterdam Ave. between 116th and 117th Streets, New York, to Schacht Steel Construction Inc., New York.

1000 tons, galvanized transmission towers, Public Service Corp. of New Jersey, to Lehigh Structural Steel Co., Allentown, Pa.

455 tons, four state bridges, Fall River, Mass., to Tower Iron Works, Providence, R. I.; Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor.

240 tons, tee sections, Navy, to Jones & Laughlin Steel Corp., Pittsburgh.

150 tons, phase 3, Hanford Works, to Pacific Car & Foundry Co., Seattle; Shaw & Estes, general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2450 tons, north approaches, Washington State freeway bridge, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; MacRae Bros., Seattle, general contractor, low at $1,838,402.

1165 tons, Lake Washington freeway bridge, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Paul Jarvis Inc., Seattle, subcontractor; Allied Structural Co., Chicago, general contractor at $6,943,568.

920 tons, ocean terminal, Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; DeLong Construction Co., New York, general contractor.

550 tons, four state highway structures and retaining wall, Fall River, Mass., to Northern Steel Inc., Boston; Campanella & Cardi Construction Co., Providence, R. I., general contractor.

530 tons, reconstruction of military structures, Shemya Island, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; B-E-C-K & Associates, Seattle, general contractor, low at $8,682,451.

525 tons, Hanson Dam, near Seattle, to Joseph T. Ryerson & Son Inc., Seattle; Kaiser Construction & Associates, general contractor.

450 tons, 13-span composite, WF beam bridge, Winooski River, Montpelier, Vt., to Truscon Steel Div., Republic Steel Corp., Boston; E. D. Swett Inc., Pembroke, N. H., general contractor; also 2378 (linear) ft. steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

375 tons, two Washington State highway crossings, King County, to J. D. English Steel Co., Tacoma, Wash.; S. S. Mullen Inc., Seattle, general contractor.

255 tons, Windsor garage project, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co., Seattle, general contractor.

240 tons, school structure, Ellensburg, Wash., to Joseph T. Ryerson & Son Inc., Seattle; Vandervoort Construction Co., general contractor.

210 tons, Washington State highway projects Spokane and Moses Lake, to Bethlehem Pacific Coast Steel Corp., Seattle; Cherf Bros. & Sandkay Co., Moses Lake, general contractor.

170 tons, regional vocational school, Hartford, Conn., to Scherer Steel Co., Hartford; Wexler Construction Co., Newton Highlands, Mass., general contractor.

130 tons, three-span girder and rolled beam bridge, Ansonia, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Mariani Construction Co., New Haven, Conn., general contractor.

100 tons, including structurals, hospital addition, Willimantic, Conn., to Scherer Steel Co., East Hartford, Conn.; Wadhams & May Co., Hartford, Conn., general contractor; structural steel to Charles Parker Co., Meriden, Conn.

PLATES . . .

PLATES PLACED

18,855 tons, 54 to 66 in. diameter waterpipe (if welded plate) Tolt River supply line, Seattle; job went to Valley Construction Co. and Morrison-Knudsen Co., Seattle, for prestressed concrete, at $6,984,693.

16,000 tons, including rods, sheets, etc., 28-

mile Toit River pipeline project, Seattle, divided between United Concrete Pipe Co., Auburn, Wash., and American Pipe & Construction Co., Portland, Oreg.; general contract to Morrison-Knudsen Co. Inc. and Valley Construction Co., Seattle, at $6,984,692 for prestressed concrete.

2000 tons, 28,200 ft 48-in. water supply pipe, Everett, Wash., for concrete cylinder, to American Pipe & Construction Co., Portland, Oreg.

1200 tons, carbon, medium tensile, hull plates, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (America) Inc., New York.

1140 tons, 341 ft steel auto ferry for Black Ball Transport Inc. to Columbia-Geneva Steel Div., U. S. Steel Corp., San Francisco; Puget Sound Bridge & Dredging Co., Seattle, general contractor.

700 tons, 2-million-gal tank, T. A. D. Jones Co., New Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

595 tons, hull plates, Navy, to C. Itoh & Co. (America), New York.

490 tons, carbon, medium tensile, hull plates, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

475 tons, surplus steel sheet piling, Rocky Reach project, Wenatchee, Wash., to Manson Construction & Engineering Co., Seattle, on bid of $43,806.

315 tons, carbon, medium tensile, hull plates, General Stores Supply Office, Navy, Philadelphia, to Columbia-Geneva Div., U. S. Steel Corp., Washington.

300 tons, supply officer, Naval shipyard, Portsmouth, N. H., to Lukens Steel Co., Coatesville, Pa., two contracts.

220 tons, high tensile, Grade HY-80, Navy Purchasing Office, Washington, to Lukens Steel Co., Coatesville, Pa.; two contracts.

130 tons, high tensile, Grade HY-80, Navy Purchasing Office, Washington, to U. S. Steel Corp., Pittsburgh.

100 tons or more, fuel storage tanks, Turner Air Force Base, Albany, Ga., to Chicago Bridge & Iron Co., Chicago.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian Pacific, 64 locomotives placed; orders comprise twelve, 660 hp diesel road switchers, six, 1000 hp lightweight diesel road switchers, and thirteen, 1000 hp diesel road switchers to Montreal Locomotive Works; sixteen, 1200 hp diesel road switchers, and fifteen, 1750 hp diesel road switchers to General Motors Diesel Ltd.; two, 500 hp hydraulic switchers to Canadian Locomotive Co.

Kansas City Southern, three, 1750 hp diesel electric road switchers to Electro-Motive Div., General Motors Corp., La Grange, Ill.

Canadian National, 140 diesel-electric locomotives, placed; Montreal Locomotive Works, Montreal, Canada, will build fifty, 1800-hp road switchers and twenty-six, 1000-hp yard switchers; General Motors Diesel Ltd., London, Ont., twenty-four, 1750-hp road switchers, thirty-eight, 1200-hp road switchers, and two, 1200-hp road switchers.

Cedar Rapids & Iowa City, one diesel-electric switching unit, to Electro Motive Div., General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Norfolk & Western, 26 seventy-ton covered hoppercars to ACF Industries Inc., New York.

Wabash, 50 seventy-ton covered hoppercars to ACF Industries Inc., New York.

Missouri Pacific, 600 freight cars to its own shops at De Soto, Mo.; program includes 50 seventy-ton covered gondola cars.

Illinois Central, 50 seventy-ton covered hoppercars, to Pullman-Standard Car Mfg. Co., Chicago.

North American Car Corp., 100 piggyback flatcars, to Pullman-Standard Car Mfg. Co., Chicago, for lease to a western railroad.

Canadian Pacific, 1464 freight cars, placed; 500 automobile cars went to Canadian Car Co., 300 boxcars to Eastern Car Co., 300 flatcars, 200 boxcars, and 14 air-dump cars to National Steel Car Corp., and 150 covered hoppercars to Marine Industries Ltd.

Kansas City Southern, 50, seventy-ton covered hoppercars, 100, fifty-ton boxcars, and ten baggage cars, to Pullman-Standard Car Mfg. Co., Chicago.

Erie, two hundred, 30 ft 6 in. boxcars, to Pullman-Standard Car Mfg. Co., Chicago; equipment will be built at the Michigan City, Ind., shops—125 to be delivered in April and 75 in May.

Sault Ste. Marie, 50 seventy-ton covered hopper cars, 25 to the Pullman-Standard Car Mfg. Co., Chicago, and 25 to the American Car & Foundry Div., ACF Industries, New York.

Union Pacific, 1400 freight cars, 1000, fifty-ft boxcars to the railroad's own shops in Omaha, Nebr.; 300 seventy-ton covered hoppercars, 150 to the American Car & Foundry Div., Chicago; and 100, seventy-ton covered hoppercars to General American Car Transportation Corp., Chicago. General Steel Castings Corp., Granite City, Ill., will furnish underframes for 800 of the boxcars.

Steel Ingot Production—February, 1959

Period	OPEN HEARTH (Net tons)	BESSEMER (Net tons)	OXYGEN PROCESS (Net tons)	ELECTRIC (Net tons)	TOTAL (Net tons)	TOTAL Per cent of capacity
1959						
*January ..	8,281,000	120,005	186,820	729,575	9,317,385	74.3
†February ..	8,540,000	129,000	177,000	757,000	9,603,000	84.8

	—OPEN HEARTH—		—BESSEMER—		—ELECTRIC—		—TOTAL—	
Period	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1958								
January ..	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,912	56.5
February .	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr. ..	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,378,942	63.4	88,125	26.6	660,413	55.8	7,127,480	61.6
2nd Qtr. ..	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo..	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1
July	5,712,587	55.0	114,218	33.4	615,600	50.4	6,442,405	53.9
August ...	6,481,185	62.4	134,435	39.3	692,383	56.6	7,308,003	61.1
September..	6,769,660	67.3	103,194	31.2	759,518	64.2	7,632,372	66.0
3rd Qtr. ..	18,963,432	61.5	351,847	34.7	2,067,501	57.0	21,382,780	60.3
9 Mo.	52,756,296	57.7	985,023	32.7	5,393,948	50.1	59,135,267	56.2
October ...	7,795,541	75.0	148,458	43.4	895,779	73.3	8,839,778	74.0
November..	7,572,555	75.3	145,867	44.1	850,896	71.9	8,569,318	74.1
*December .	7,755,002	74.6	116,637	34.1	838,883	68.6	8,710,522	72.9
*4th Qtr. .	23,123,098	75.0	410,962	40.5	2,585,558	71.3	26,119,618	73.6
*2nd 6 Mo.	42,086,530	68.3	762,809	37.6	4,653,059	64.1	47,502,398	67.0
*Total	75,879,394	62.0	1,395,985	34.7	7,979,506	55.4	85,254,885	60.6

Note—The percentages are based on annual capacities as of Jan. 1, 1959: Open hearth, 126,528,380 net tons; bessemer, 3,577,000 net tons; basic oxygen process, 4,033,160 net tons; electric and crucible, 13,495,130 net tons. Total: 147,633,670 net tons. In 1958, the capacity tonnages were: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric and crucible, 14,393,740 net tons. Total: 140,742,570 net tons.
*Revised. †Preliminary.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

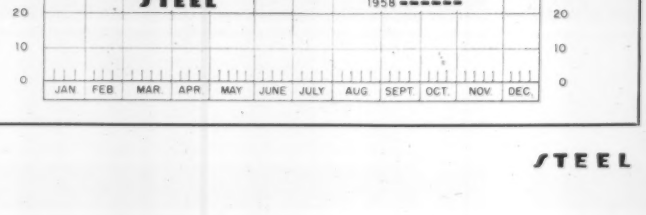
	Week Ended Mar. 22	Change	Same Week 1958	Same Week 1957
Pittsburgh	94	+ 2*	55.5	95.5
Chicago	93	— 0.5*	52.5	89.5
Eastern	91	0	53	97
Youngstown	92	0	47	96
Wheeling	95	+ 4	73	95
Cleveland	96.5	+ 2*	31	89.5
Buffalo 105		0	36.5	100
Birmingham	88	+ 2.5	47.5	99
Cincinnati	87.5	— 5*	53.5	80
St. Louis	84	— 3.5*	73	102
Detroit	99	— 1*	42	92
Western	96	+ 2	67	106
National Rate ..	92.5	— 0.5	52.5	94

INGOT PRODUCTION‡

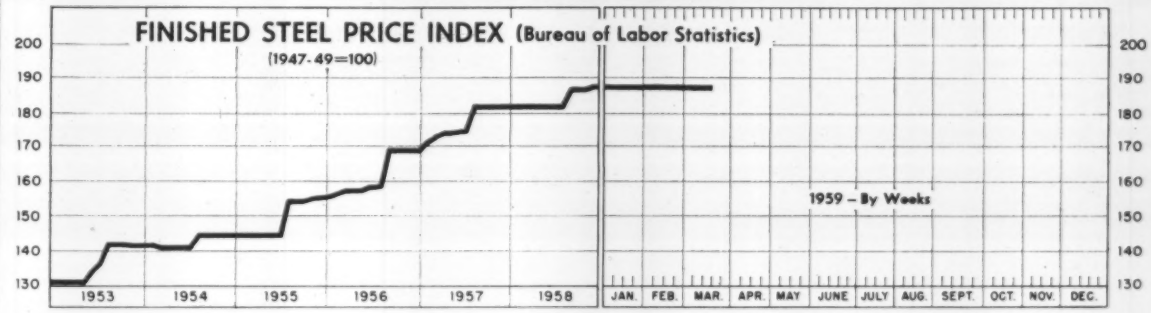
	Week Ended Mar. 22	Week Ago	Month Ago	Year Ago
INDEX ..... (1947-49=100)	162.5†	162.1	152.5	88.2
NET TONS .... (In thousands)	2,610†	2,604	2,449	1,417

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Mar. 17, 1959	Week Ago	Month Ago	Feb. Avg	Year Ago
186.7	186.7	187.0	187.0	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended March 17

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.673
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.53
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	207.483
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.719
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	March 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.73
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	41.67	41.67	42.50	36.33	24.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	March 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.06	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.06	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ⅜-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	March 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$44.50	$44.50	$43.50	$36.50	$25.50
No. 1 Heavy Melt, E. Pa.	38.00	38.00	40.00	38.50	22.00
No. 1 Heavy Melt, Chicago	42.50	42.50	44.00	34.00	25.50
No. 1 Heavy Melt, Valley	45.50	45.50	48.50	37.50	23.50
No. 1 Heavy Melt, Cleve.	41.50	41.50	44.50	33.50	20.50
No. 1 Heavy Melt, Buffalo	39.50	39.50	41.50	28.50	24.00
Rails, Rerolling, Chicago	62.50	62.50	64.50	54.50	36.50
No. 1 Cast, Chicago	48.50	48.50	49.50	41.50	33.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, March 18, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 161, footnotes, page 163.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3 ..104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....113.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N15 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
Los Angeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon
(Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich(9) G5 ....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 ....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 ..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ..5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 ....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded
(Including loaded extra)
Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N. J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N. J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. (5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 ....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ..9.325
Massillon,O. R2, R8 ..9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025
Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ..9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft. Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 ....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt) L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ...5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portmsouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 ....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ...7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.375
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ...6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ....7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 .....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....9.275
Cleveland J5, R2 ....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2. 9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Asland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co., Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co
W18 Wyckoff Steel Co

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton, Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle (25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2,Y1.7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3 8.325
SparrowsPoint,Md. B2..7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ..7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 .....7.425
Detroit D2, M1, P20 ..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 ....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ...7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven, Conn. D2 ..7.875
NewKensington,Pa. A6 7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ..7.975
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ....15.85
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ..10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
New York W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 ....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41 .....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75
ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 bl)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10 65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.20
GraniteCity,Ill. G4 ....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg,Calif. C11 ....8.85
SparrowsPoint,Md. B2 .8.25
Weirton,W.Va. W6 ....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 ....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8 ..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity, Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
N.Tonawanda,N.Y. B11..8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ....8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ....12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 ....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ...13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ...10.05
Palmer,Mass. W2 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 ....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Millbury,Mass.(12) N6 .10.05
Minnequa,Colo. C10 ...9.95
Monessen,Pa. P7, P16..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 ....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ....13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 .....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth,A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
Los Angeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt., Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage) — **An'ld Stone** — **Galv. Stone**

Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r.Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
Sterling(37)N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality (6 to 8 gage) — **An'ld** — **Galv.**

Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70§§
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 0.9c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

⅜ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 74" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅜		¼		⅝		½		¾		1		1¼	
List Per Ft	5.5c		8c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	28.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	31.50	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	29.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	32.75	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	34.00	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	34.50	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	38.25	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	39.75	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	51.25	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	63.75	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	51.25	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	62.25	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	41.50	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	22.25	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	34.75	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	22.50	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

Stainless	Plates: Carbon Base 5%	10%	15%	20%	Sheets: Carbon Base 20%
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base, Cold Rolled: 10%	Both Sides
Copper*	$35.85	$42.50

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	9.31	10.40	11.97	53.50	9.73	10.11	13.39 #	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.30	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.08
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.10	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.35	11.55	12.55	57.38	10.80	11.05	14.70	16.80	10.25	10.15	13.05
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga, Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa.,$260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ⅛ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$10.75-11.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.915-$0.965 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.0C

Turkish

48% 3:1	51.00-55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: 98% Fe: F.o.b. Camden or Riverton, N. J., freight allowed east of Mississippi river, ocean bags, 23,000 lb and over	11.25
Sponge Iron, Domestic, 98% Fe: F.o.b. Riverton, N. J., freight allowed east of Mississippi River: 100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.40-50.90†
Bronze, 5000-lb lots	52.20-56.20†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.80-57.20†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10-53.60†
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min.minus 65 mesh	nom.**
1000 lb	2.80
less 1000 lb	2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5 10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.60	6.60	6.60	6.95
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (§)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal., f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	22.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, del.

Phenol, 90 per cent grade	15.50

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

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Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.006% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, carload 45.75c, ton lot 47.25c, less ton lot. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c, less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.06% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 24.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2¼ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

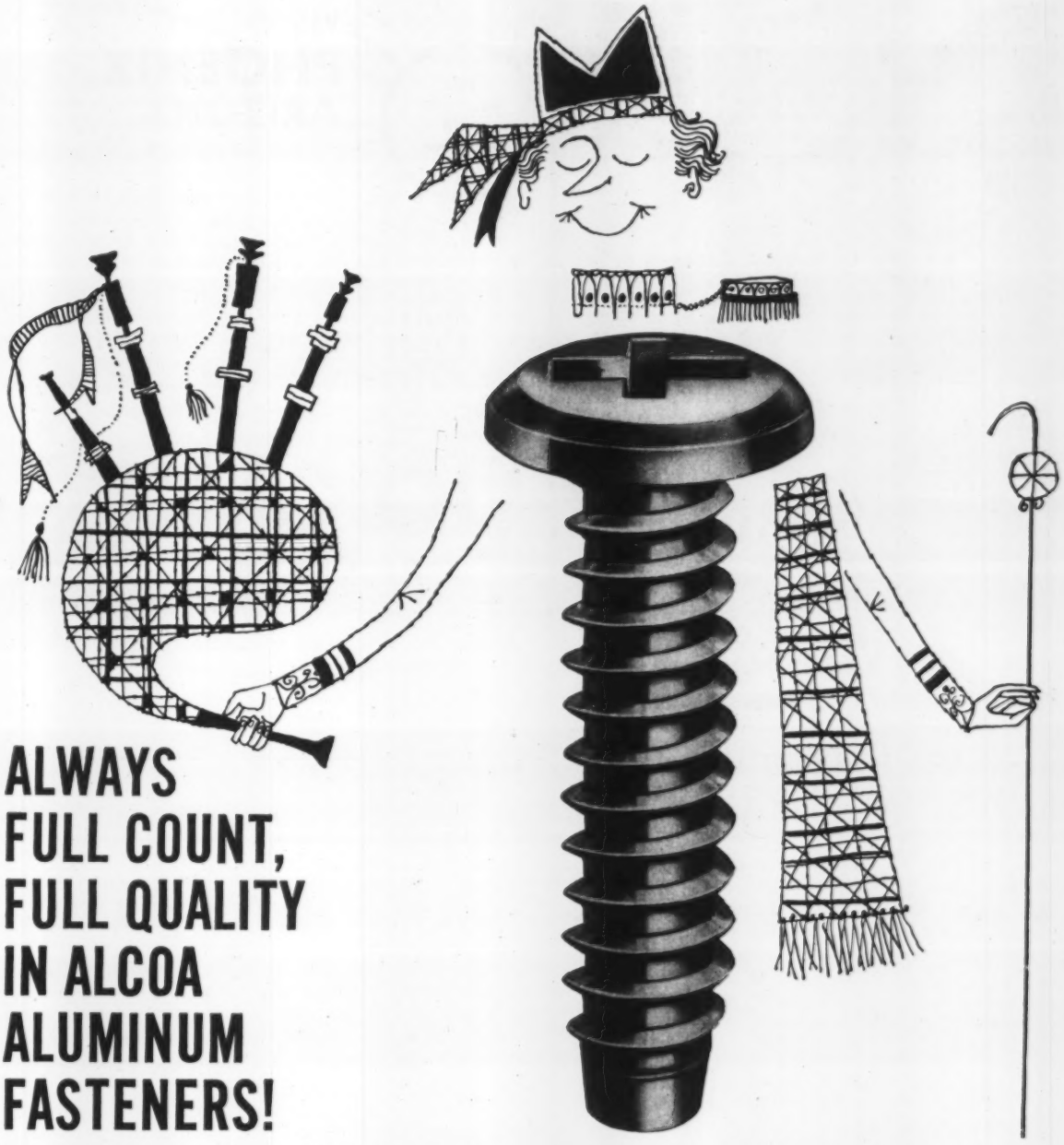
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



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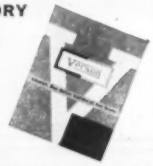

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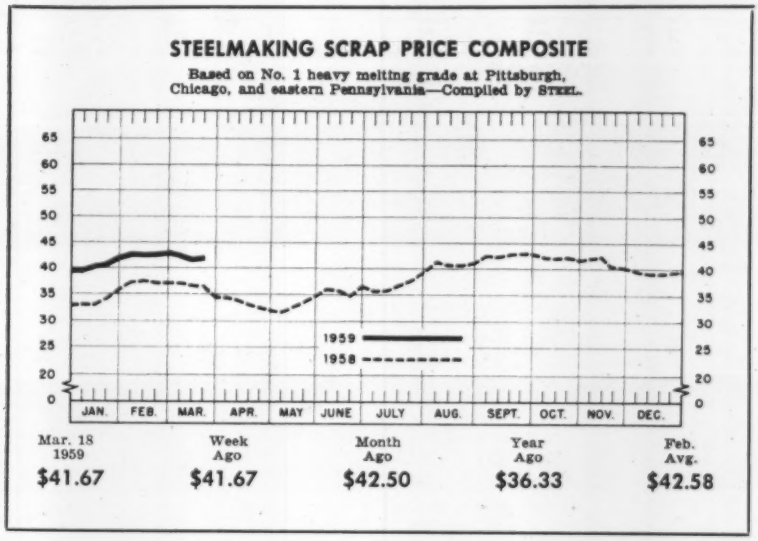

Scrapmen Expect Late March Pickup

STEEL's composite on No. 1 heavy melting holds unchanged at $41.67, but market tone is weak. Mills still show little interest in dealer material. Export business is increasing

Scrap Prices, Page 172

Pittsburgh — Heavy consumption of home scrap and hot metal by leading steelmakers continues to depress the market. Dealers grumble about oversupply and lack of demand. Mills are anxious to clean up inventories. They could probably buy small quantities of No. 1 heavy melting for $43-$44 a ton, but not without risking a price hike.

Chicago — Trading is listless. Prices are unchanged and are largely nominal in the absence of representative buying. Inventories held by the steel mills are substantial. Dealers' stocks are also heavy. A test is expected this week when the mills are expected to enter the market for April tonnage.

Philadelphia—There's no change in prices here. Processors report domestic business continues slow, but they say exports are increasing, particularly to Japan.

New York—Prime grades of open hearth steel are on the easy side. Japan has closed on substantial tonnage for shipment over the next six months, but domestic demand is sluggish despite high level steelmaking operations. Prospects for milder weather over coming weeks encourage hopes of a better flow of yard scrap.

Brokers are offering $30-$32 for No. 1 heavy melting and No. 1 bundles and $27-$29 for No. 2 heavy melting. Prices on other grades, including cast iron and stainless, are unchanged.

Cleveland—Buying continues limited, the mills leaning heavily on home generated scrap and hot metal. Although steelmaking operations at 96.5 per cent of capacity are the highest in the district in many months, local mills appear plentifully supplied with metallics to support their melts without resort to dealer scrap. Monthend auto list bids will point the way for prices in April.

Buffalo — Firmness in the cast scrap market is noted here. Cupola cast at $48 is up $1 on recent sales. Machinery cast is quoted $1 higher. Mill scrap is quiet with no new business expected until early April. Mills are well supplied despite capacity operations. Bad weather slowed down the movement and processing of scrap last week.

Detroit — Prices continue to tumble as dealers' yards are piled with scrap and the mills continue to depend on industrial material and hot metal. The feeling is strong that prices will continue the downtrend through the rest of this month, possibly beyond. Only scattered buys of specialty items were reported last week. All the No. 1 grades of material are quoted $2 lower and the No. 2 grades and turnings $1. The foundry grades also are off $1, except for clean auto cast which appears to be holding.

Cincinnati — Buying is lacking, and first-of-the-month mill orders are being rapidly completed. Brokers see no evidence of price resistance by dealers.

St. Louis—While scrap is moving to the mills steadily, there's not much buying. Steelmakers' inventories are substantial. Prices are unchanged.

Birmingham—The larger mills are staying out of the market entirely, or are buying only limited tonnages. Foundries are also buying sparingly. Result: Stable prices. Dealers are filling old orders at quoted levels, but consumers are unwilling to buy sizable quantities at the going market. Pressure pipe manufacturers are on reduced production schedules.

Houston—Strengthened by orders from area mills and some for export, the district market is on a firm base. Earlier this month, the Houston mill posted an advance of $3 a ton in its buying prices. Later, a second Texas mill raised its buying prices $1 a ton. Brokers quote No. 1 heavy melting at $36-$38 on orders from both mills. Spotty buying for export is being done at $38 for No. 1 heavy melting in Louisiana.

San Francisco — Expected export business is imparting a firm tone to the local market. The district mills are consuming a lot of material, putting support under the higher level of prices that was recently attained.

Seattle—New business is expected from Japan shortly. Sellers are making allocations in anticipation of a renewal of buying by Far East consumers. Local business is not much improved—large consumers' inventories are heavy. Prices are nominally higher at $33 for No. 1 heavy melting, and $30 for No. 2 heavy melting.

Los Angeles—Demand continues light. No early pickup is foreseen. Foreign buying provides a bright spot in the market picture. Prices are steady.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, March 18, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Mar. 18	$41.67
Mar. 11	41.67
Feb. Avg.	42.58
Mar. 1958	35.83
Mar. 1954	24.37

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	36.00-37.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	30.00-31.00
No. 1 busheling	44.00-45.00
No. 1 factory bundles	*51.00-52.00*
Machine shop turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut structurals:	
2 ft and under	51.00-52.00
3 ft lengths	50.00-51.00
Heavy turnings	36.00-37.00
Punchings & plate scrap	52.00-53.00
Electric furnace bundles	52.00-53.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Random rails	55.00-56.00
Railroad specialties	*51.00-52.00*
Angles, splice bars	*51.00-52.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	43.00-44.00
No. 1 hvy melt., dealer	41.00-42.00
No. 2 heavy melting	35.00-36.00
No. 1 factory bundles	46.00-47.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	28.00-29.00
No. 1 busheling, indus.	43.00-44.00
No. 1 busheling, dealer	41.00-42.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	47.00-48.00
Punchings & plate scrap	48.00-49.00

Cast Iron Grades

No. 1 cupola	48.00-49.00
Stove plate	44.00-45.00
Unstripped motor blocks	38.00-39.00
Clean auto cast	55.00-56.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	58.00-59.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Angles, splice bars	53.00-54.00
Axles	71.00-72.00
Rails, rerolling	62.00-63.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-225.00
18-8 turnings	120.00-125.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	32.00-33.00
No. 1 busheling	45.00-46.00
No. 1 bundles	45.00-46.00
No. 2 bundles	29.00-30.00
Machine shop turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Lows phos.	47.00-48.00
Electric furnace bundles	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00

CLEVELAND

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	41.00-42.00
No. 2 bundles	28.00-29.00
No. 1 busheling	41.00-42.00
Machine shop turnings	16.00-17.00
Short shovel turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut foundry steel	41.00-42.00
Cut structurals, plates 2 ft and under	48.00-49.00
Low phos, punchings & plate	42.00-43.00
Alloy free, short shovel turnings	24.00-25.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Charging box cast	40.00-41.00
Heavy breakable cast	40.00-41.00
Stove plate	46.00-47.00
Unstripped motor blocks	35.00-36.00
Brake shoes	38.00-39.00
Clean auto cast	49.00-50.00
Burnt cast	39.00-40.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	59.00-60.00
Rails, 18 in. and under	60.00-61.00
Rails, random lengths	54.00-55.00
Cast steel	48.00-49.00
Railroad specialties	52.00-53.00
Uncut tires	45.00-46.00
Angles, splice bars	53.00-54.00
Rails, rerolling	58.00-59.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	38.00
No. 2 bundles	27.00
No. 1 busheling	38.00
Machine shop turnings	20.00
Short shovel turnings	22.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	*41.00*
Clean auto cast	50.00
Stove plate	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00*
Rails, 18 in. and under	53.00
Rails, random lengths	47.50
Rails, rerolling	59.00
Angles, splice bars	49.00

BIRMINGHAM

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	*21.00-22.00*
No. 1 busheling	33.00-34.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bars, crops and plates	42.00-43.00
Structurals & plates	41.00-42.00
Electric furnace bundles	39.00-40.00
Electric furnace:	
2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	51.00-52.00
Rails, rerolling	55.00-56.00
Rails, random lengths	43.00-44.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	38.00
No. 2 heavy melting	34.00
No. 1 bundles	41.00
No. 2 bundles	24.00-26.00
No. 1 busheling	40.00
Electric furnace bundles	42.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	25.00-27.00
Machine shop turnings	21.00-22.00
Heavy turnings	36.00-37.00
Structurals & plate	44.00-45.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	59.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Malleable	68.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-32.00*
No. 2 heavy melting	*27.00-29.00*
No. 1 bundles	*30.00-32.00*
No. 2 bundles	19.00-20.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	16.00-17.00
Low phos. (structurals & plates)	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	90.00-95.00

BUFFALO

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	39.00-40.00
No. 2 bundles	27.00-28.00
No. 1 busheling	39.00-40.00
Mixed borings, turnings	20.00-21.00
Machine shop turnings	18.00-19.00
Short shovel turnings	22.00-23.00
Cast iron borings	20.00-21.00
Low phos. structurals and plate, 2 ft and under	47.00-48.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*47.00-48.00*
No. 1 machinery	*51.00-52.00*

Railroad Scrap

Rails, random lengths	49.00-50.00
Rails, 3 ft and under	55.00-56.00
Railroad specialties	48.00-49.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	37.50-38.50
No. 2 heavy melting	32.50-33.50
No. 1 bundles	37.50-38.50
No. 2 bundles	24.00-25.00
No. 1 busheling	37.50-38.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*19.00-20.00*
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	40.00-41.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	50.00-51.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	38.00
No. 2 heavy melting	35.00
No. 1 bundles	38.00
No. 2 bundles	23.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	43.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*30.00*
No. 2 heavy melting	23.00-23.50
No. 1 bundles	*30.00*
No. 1 busheling	*30.00*
Machine shop turnings	11.00-11.50
Short shovel turnings	*13.00-14.00*
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	34.00-35.00
No. 2 bundles	21.00-22.00
No. 1 busheling	32.00-33.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	16.00-17.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Stove plate	32.00-33.00
Charging box cast	33.00-34.00
Heavy breakable	34.00-35.00
Unstripped motor blocks	22.00-23.00
Clean auto cast	47.00-48.00

SEATTLE

No. 1 heavy melting	*33.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*29.00†*
No. 2 bundles	*23.00†*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	*33.00*
No. 2 bundles	21.00
Machine shop turnings	19.00
Shoveling turnings	20.00
Cast iron borings	20.00
Cut structurals and plate 1 ft and under	*47.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt	38.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	34.50
No. 2 heavy melting	30.50
No. 1 bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	34.50
Unprepared	28.50
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00

†Nominal.
‡F.o.b. Hamilton, Ont.

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE

Rub specimen with emory paper to obtain clean surface. Add a drop of 1:1 nitric acid. If there is no attack the material is stainless steel. Test sample with magnet. If it is definitely non-magnetic it belongs to the 18-8 stainless steel series. Place specimen in a solution of muriatic acid (1 part water, 1 part muriatic acid) at a temperature of 180/190 degrees F. After 5 minutes, Types 302, 304, 305, 316, 317, 321 and 347 will be white, while 303 will have a black smudge. Then place specimen in fresh solution of muriatic acid at the same temperature as before. Types 316 and 317 will show very slight attack in contrast to the others which will have active attack and gas evolution.

Here is how to test for

STAINLESS STEEL TYPES 316 and 317

To achieve the extra corrosion and erosion resistance necessary for a wide range of applications, the basic 18-8 stainless composition was modified by the addition of molybdenum to produce Type 316.

For increased corrosion resistance, Type 317 has been developed which contains a higher chromium and molybdenum content.

These two stainless steels are used in the textile, paper and chemical industries where it is necessary for an alloy to offer maximum protection from the effects of strong sulphates, chlorides, phosphates and reducing acids.

Type 316, which is produced in considerably larger tonnage than Type 317, is also used to combat the damaging effects of salt spray on marine and seacoast construction and in manufacturing areas where harmful industrial fumes are present.

Because of the molybdenum content, it is highly important that Types 316 and 317 are not mixed with other stainless steel scrap.

Our personnel, equipment, experience and strategically located facilities are specifically geared to fulfill present and future needs for dependably segregated scrap. We welcome your inquiry.

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Copper Users Fear Shortage

Concern over availability is one reason buying is so hectic. Labor unrest and fears of political flare-ups undermine confidence in market. Primary price could rise

Nonferrous Metal Prices, Pages 176 & 177

THE COPPER MARKET in recent weeks has been as unsteady as the nerves of a bobsled rider during an avalanche. Users don't hesitate to plunk down cash to anyone who can get metal, be it primary producers, custom smelters, or even dealers.

Here's why: Consumers fear a copper shortage. While consumption is good, it is evident that many buyers are laying in more stocks than they need for ordinary inventory replenishment. That's one reason why what looked like a stabilizing market a short time ago has turned into one where anything can happen.

• **Rebuttal**—February statistics of the Copper Institute indicate the fears may be exaggerated. While shipments to fabricators rose to 120,134 tons, vs 114,425 tons in January (see chart), producers' stocks showed their first real increase since last May (about 5000 tons). Reason: Domestic primary production hit an all-time high of 3234 tons a day.

• **Catalysts**—Users are only partly to blame for the hectic market. Lately they've been buffeted by a series of national and international crises beyond their control which threaten both the price and supply of copper. Some examples:

• A strike at Kennecott Copper Corp.'s Ray Mine Div. in Arizona (since Feb. 26) which has idled facilities with an annual capacity of 66,000 tons.

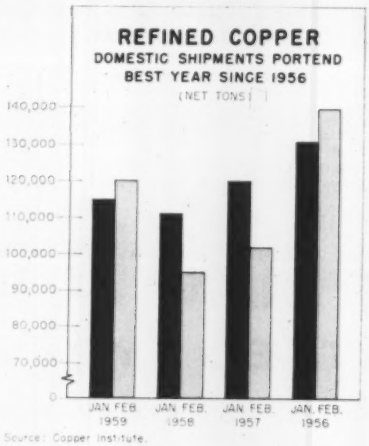
• Sporadic wildcat walkouts at several copper plants here and abroad.

• A labor dispute that has shut down American Smelting & Refining Co.'s 60,000 ton a year facility at Tacoma, Wash.

• Railroad labor difficulties and political problems in Africa.

• The chance that Khruschev's ultimatium to the West to get out of Berlin might ignite a global war.

A combination of those factors sent prices on the London Metal Exchange spiraling well over 32 cents a pound last week. The situation did nothing to console users since it's a bullish influence on the domestic price of 31.5 cents a pound.



• **Few Exports, Imports** — At the present price differential between London and the U. S., it's not profitable for domestic producers to pay the 0.85 to 0.87 cent a pound charge to ship copper overseas, which is a plus for U. S. consumers. But it's even more uneconomical for a foreign operator to export to this country and have to pay the 3 to 3.5 cents a pound freight charges and duty—bad news for the buyer who can't get as much as he wants.

• **Prices Bullish**—As STEEL went to press last week here was the situation in the copper market:

Custom smelters were up 2 cents a pound to 34 cents (2.5 cents over primary) after having been out of the market for several days because of their inability to obtain scrap. (Dealers have evidently been holding up scrap in anticipation of higher prices.) The 34 cent price may or may not attract adequate scrap. Look for custom smelters to boost prices again soon.

Copper dealers were getting 35 to 35.5 cents a pound.

Many metalmen were beginning to talk another hike in primary copper. Among copper people reactions varied from "we hope we don't have to raise" to "it's just a matter of time."

• **Summing Up**—The copper market is so volatile the price is a day to day affair. Unless the labor unrest is quelled soon and buying becomes less hectic, odds seem slim for price stability. But if the opportunity arises, strong segments within the industry will pressure to hold the line. They're sensitive to customer criticism of price instability in relation to competing metals.

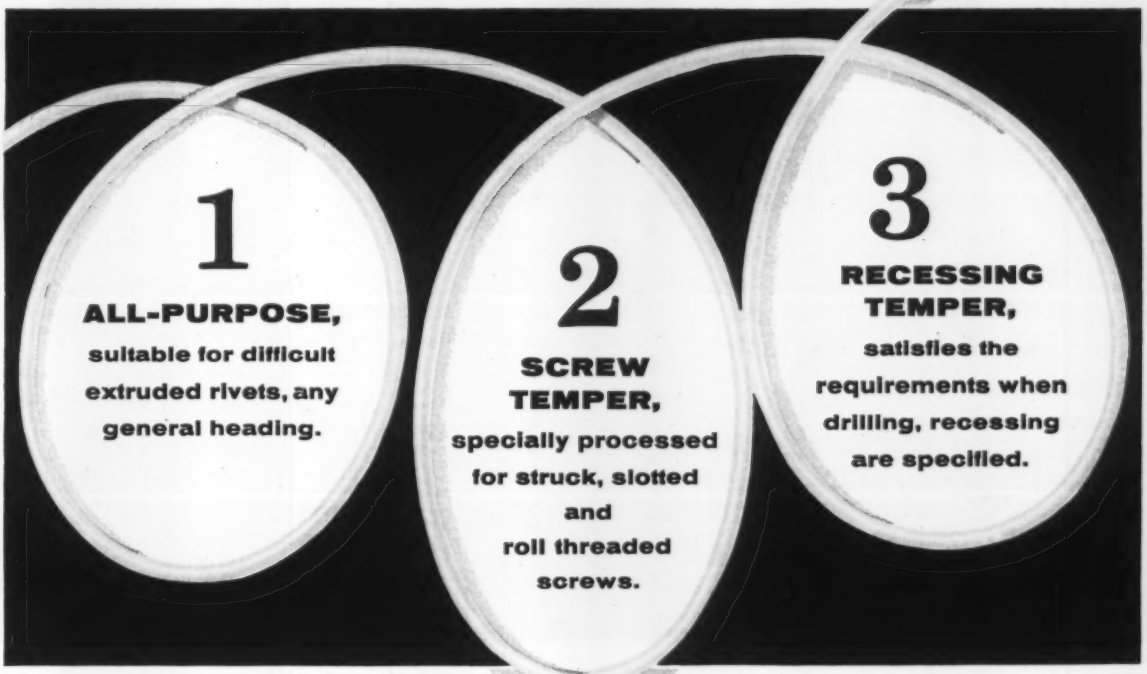
NONFERROUS PRICE RECORD

	Price Mar. 18	Last Change	Previous Price	Feb. Avg	Jan. Avg	Mar., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	31.50–34.00	Mar. 16, 1959	31.50–32.00	30.159	29.212	24.163
Lead	11.30	Mar. 5, 1959	10.80	11.368	12.415	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.375	Mar. 18, 1959	103.50	102.364	99.409	93.425
Zinc	11.00	Feb. 25, 1959	11.50	11.409	11.500	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

TRI·TEMP

means you can get ALL 3 TEMPERS in BRISTOL Extruded Heading Wire



Bristol offers three special tempers in cold heading wire and all of these tempers possess uniform flow characteristics.

What's more, you can get them in any of these five alloys: 87-13 . . . 90-10 . . . 85-15 . . . 70-30 . . . 65-35 . . . as well as in nickel silver and silicon bronze.

What are *your* requirements?
Just call LUdlow 2-3161.

The **BRISTOL BRASS CORPORATION**

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld. **Cobalt:** 97.99%, $1.75 per lb for 500-lb keg; $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 34.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.30; chemical, 11.40; corroding, 11.40, St. Louis. New York basis, add 0.20.

Lithium: Cups or ingots, 50-100 lb, $10 per lb, f.o.b. Minneapolis; 100-500 lb, $9.50 per lb deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $221-224 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 103.375.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass, No. 115, 32.25; tin bronze, No. 225, 43.25; No. 245, 37.00; high-leaded tin bronze, No. 305, 36.50; No. 1 yellow No. 405, 26.50; manganese bronze, No. 421, 29.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.55; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.00 per cwt; pipe, full coils, $17.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; not-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circle: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam, 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 26.50-27.00; No. 2 heavy copper and wire, 24.50-25.00; light copper, 22.50-23.00; No. 1 composition red brass, 21.00-21.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	SCRAP ALLOWANCES e (Based on copper at 31.50c) Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	56.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	45.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	50.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 20.00-20.50; new brass clippings, 17.00-17.50; light brass, 14.25-14.75; heavy yellow brass, 15.25-15.75; new brass rod ends, 14.75-15.25; auto radiators, unsweated, 16.50-17.00; cocks and faucets, 17.00-17.50; brass pipe, 17.00-17.50.

Lead: Heavy, 7.50-7.75; battery plates, 3.25-3.50; linotype and stereotype, 8.75-9.25; electrotype, 7.25-7.75; mixed babbitt, 8.75-9.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-23.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.25-13.75; segregated high copper clips, 13.25-13.75; mixed low copper clips, 12.25-12.75; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high copper clips, 12.50-13.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 29.25; No. 2 heavy copper and wire, 27.75; light copper, 25.50; refinery brass (60% copper) per dry copper content, 27.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 29.25; No. 2 heavy copper and wire, 27.75; light copper, 25.50; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.50; yellow brass turnings, 16.50; radiators, 18.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 42.50, 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 122.50; 200-499 lb, 121.00; 500-999 lb, 120.50; 1000 lb or more, 120.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.60; 100-600 lb, 71.20; 700-1900 lb, 68.40; 2000-9900 lb, 66.60; 10,000 lb or more, 65.20.

Stannous Chloride (Anhydrous): 25 lb, 156.20; 100 lb, 151.40; 400 lb, 148.90; 800-19,900 lb, 108.00; 20,000 lb or more, 102.00.

Stannous Sulphate: Less than 50 lb, 141.30; 50 lb, 111.30; 100-1900 lb, 109.30; 2000 lb or more, 107.30.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

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SALES ENGINEER

Midwest chemical company seeks an engineer with production experience as representative for New York-New Jersey area. He shall contact potential customers and make marketing research in protective coatings. These coatings already have a large following throughout the United States. The position will have a good future for the right man. College degree preferred, however, not necessary. Please reply by stating your age, experience, and salary requested.

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In Schenectady, N. Y.

Capacity	Name	Span	Lift
150 Tons (2-75 T. Trolleys)	**Shepard Niles**	**100′**	**39′**
20 Tons (2-10 T. Trolleys)	Shepard Niles	98′ 10″	27′
2-20 Tons (2-10 T. Trolleys)	**N. B. P.**	**71′ 10″**	**25′ 6″**
10 Tons	Shaw	85′	22′

All Cranes 230 Volts DC — All Late Model Cranes

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Superintendent to take direct charge of all production equipment in cold roll strip steel mill. Excellent salary. References should include all possible previous job superiors.

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ROME STRIP STEEL CO., INC.
530 Henry Street Rome, N. Y.

CLASSIFIED

Help Wanted

Ceramic Engineer—Research and Development work in refractories industry; 5-10 years experience in refractories manufacturing and/or research or similar refractories experience in steel industry. Previous supervisory experience desirable. Send resume to Box 743, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED—GRADUATE METALLURGIST, experienced in steel industry. Reply Box 747, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

MECHANICAL ENGINEER, 20 years experience plant layout, design, project planning, specifications, and estimating. Desires heavier responsibilities at plant level. Midwest or far west. Subscribes to policy of full cooperation with operating people. Appropriate principal responses acknowledged. Reply Box 744, STEEL, Penton Bldg., Cleveland 13, Ohio.

—FOR SALE—

1—350 KW GE Motor Generator Set complete with 1-350 KW, 960 cycle, 800 V unity power factor inductor alternator. 500 H.P., 4000/2300 V, 3 P, 60 C, Squirrel Cage induction drive motor with extra leads for dual voltage. I. C.—2609 high frequency generator control panel 350 KW, 960 C, 800 V. NEW—never in use. In original boxes.

Subject to prior sale.

Reply Box No. 746, STEEL
Penton Bldg. Cleveland 13, Ohio

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And Further Information write
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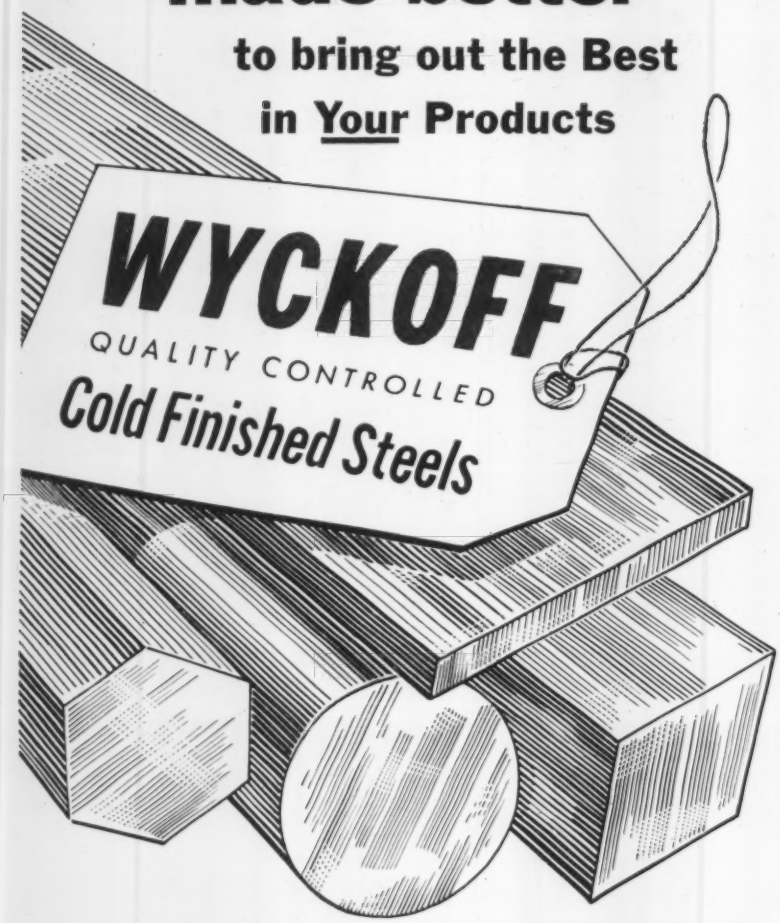
to bring out the Best in Your Products



Constant quality and metallurgical control throughout every step in the processing of Wyckoff Cold Finished Steels is your assurance of:

- *Ultimate Machinability*—in any type of screw machine or lathe
- *High Production Rates*—of closely dimensioned, accurate parts
- *Longer Tool Life*—requiring fewer tool grinds; minimum down time
- *Superior Surface Finish*—insuring close control of finished part
- *Physical Properties*—to meet your specifications

Let our metallurgists work with you in selecting the best analyses for your specific requirements.

SPECIALISTS IN COLD FINISHED STEELS EXCLUSIVELY

WYCKOFF STEEL COMPANY

GENERAL OFFICES:
Gateway Center, Pittsburgh 30, Pa.
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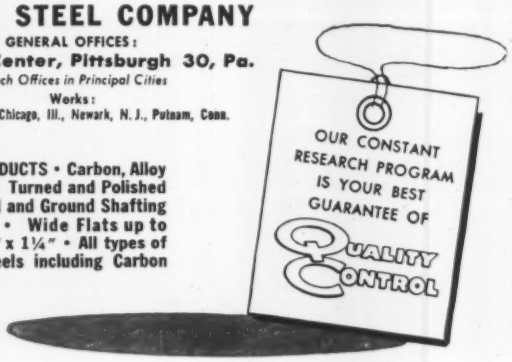
Works:
Ambridge, Pa., Chicago, Ill., Newark, N. J., Putnam, Conn.

WYCKOFF STEEL PRODUCTS • Carbon, Alloy and Leaded Steels • Turned and Polished Shafting • Turned and Ground Shafting • Large Squares • Wide Flats up to 12¾" x 2¼" and 14" x 1¼" • All types of Furnace Treated Steels including Carbon Corrected Steels



Pig Iron . . .

Pig Iron Prices, Page 165

Merchant pig iron sales so far this quarter are running ahead of those in the like period a year ago, but they show only a slight improvement over fourth quarter volume.

Blast furnace operators in the Philadelphia district note some pick-up from the gray iron field but are concerned primarily with the increased dumping of foreign iron. Previously, only the bigger users in the area were in the market for foreign iron. Now, two New York concerns are stockpiling foreign iron in Philadelphia and are selling in small quantities to anyone who wants it. Domestic iron is being undersold an average of $10 a ton.

One producer says: "It's hard to say how bad we've been hurt, but a good estimate would be that foreign iron is getting 25 per cent of the local market for pig iron." He adds that it's going to get worse. The big complaint of local producers is that the iron is being dumped.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 166

Production of coke in January totaled 5,613,162 net tons, reports the U. S. Bureau of Mines. Of the total, 5,531,107 tons were oven coke, and 82,055 tons, beehive. In the preceding month output was 5,507,645 tons (5,430,841 oven and 76,804 beehive), while in January, 1958, the total was 4,762,237 tons (4,714,610 oven and 47,627 beehive).

Stocks of oven coke held by producers at the end of January amounted to 3,792,362 net tons, equal to 21.3 days' production. At the end of December, the total was 3,814,578 tons, equal to 21.8 days' output, and at the end of January, 1958, the total was 3,299,838 tons, or 21.7 days' production.

Foundry coke sellers anticipate steady demand from the casting shops, which are operating at better levels than they were some time ago. The steel companies are consuming furnace coke actively. Blast furnace operations are estimated to be over 80 per cent of capacity. Result: Coke oven operations are the best in months.

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HOW ABOUT YOU?

Do you know that many cancers can be cured if detected early? That an annual health checkup is your best protection against cancer?

Are you giving yourself this big advantage? Or are you taking chances with your life because of foolish attitudes about cancer like these?

DON'T EVEN MENTION THAT WORD!

Fear keeps some people from even *learning* cancer facts that can save their lives.

NEVER FELT BETTER!

Checkups help to detect cancer in its "silent" stage before you notice any symptom.

COSTS TOO MUCH!

Dollars you spend for the protection of your health can mean years of life.

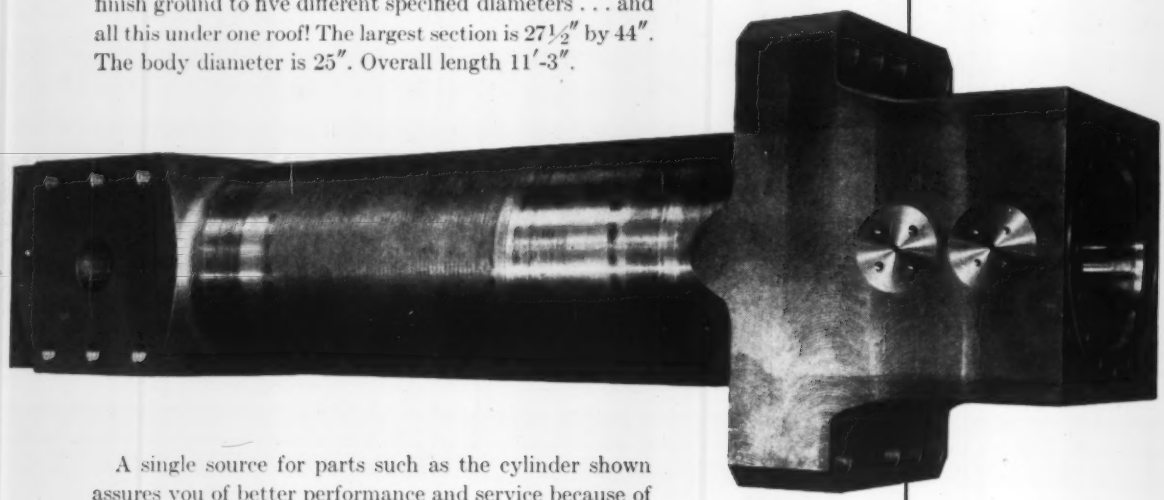
Millions of Americans have made an annual checkup a habit... *for life.* How about you?

AMERICAN CANCER SOCIETY

"Forgings by Finkl"

...from blueprint to finished part

This is a side cylinder for a hydraulic press. It was made from a Finkl C 1035 electric furnace steel forging weighing 32,000 pounds. When shipped it weighed 14,850 pounds. Between the start and finish it had been heat treated, milled, turned, tapped, and the inside bored and finish ground to five different specified diameters . . . and all this under one roof! The largest section is 27½" by 44". The body diameter is 25". Overall length 11'-3".



A single source for parts such as the cylinder shown assures you of better performance and service because of greater quality control through each step of its processing.

"Forgings by Finkl" is synonymous with highest quality. Finkl custom forgings have the stamina and fatigue resistance to withstand the severe strains and torsional stresses encountered in modern heavy duty machinery. We also produce repair parts for all types of forging equipment; containers, liners, and plungers for extrusion presses; plastic molds; and die casting steels.

Next time you are thinking of forgings, think of Finkl. The best costs the least in the long run.

HOT WORK STEELS · DIE BLOCKS · FORGINGS · ELECTRIC FURNACE STEELS

A. Finkl & Sons Co.

2011 SOUTHPORT AVE · CHICAGO 14, ILLINOIS

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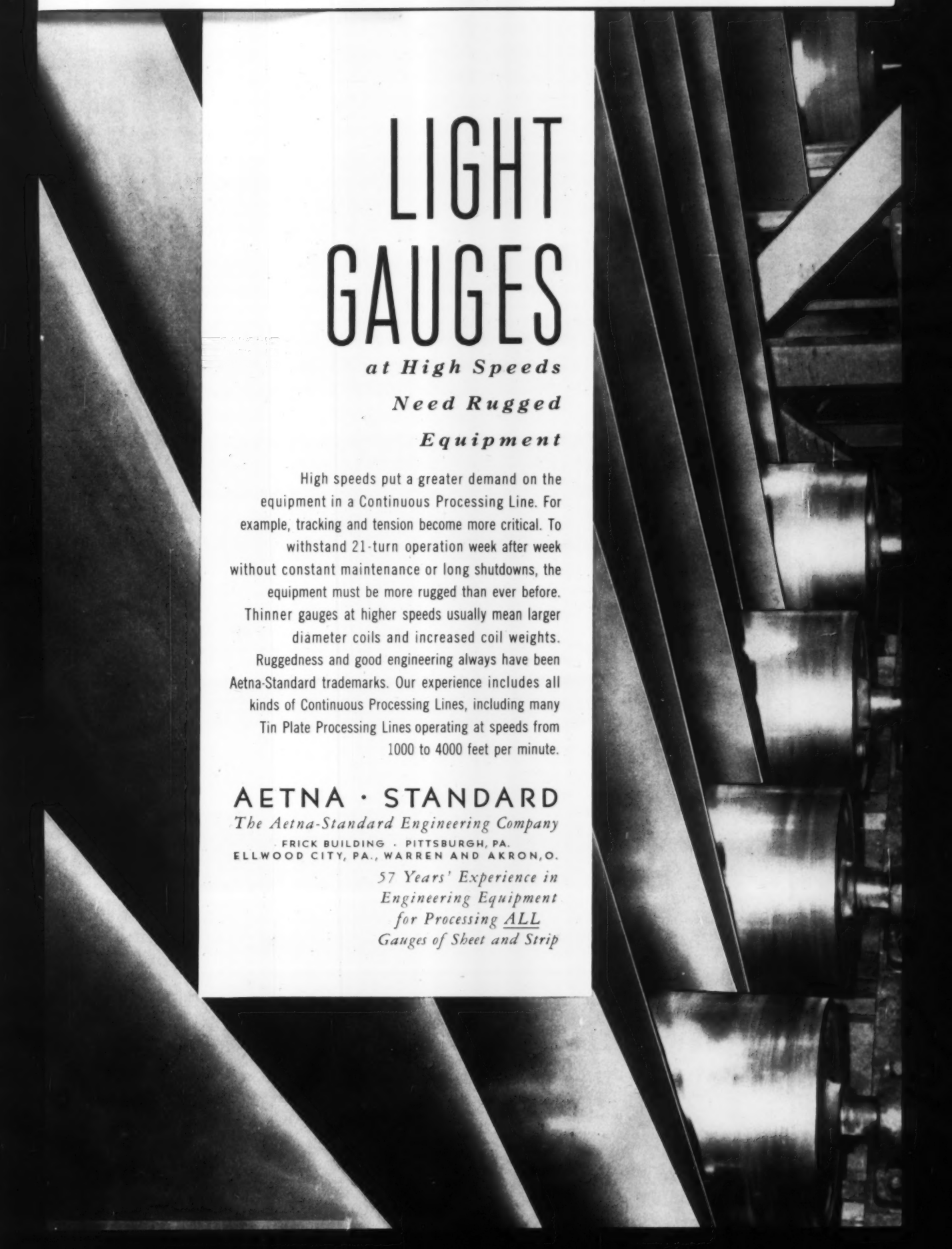


LIGHT GAUGES

at High Speeds Need Rugged Equipment

High speeds put a greater demand on the equipment in a Continuous Processing Line. For example, tracking and tension become more critical. To withstand 21-turn operation week after week without constant maintenance or long shutdowns, the equipment must be more rugged than ever before. Thinner gauges at higher speeds usually mean larger diameter coils and increased coil weights. Ruggedness and good engineering always have been Aetna-Standard trademarks. Our experience includes all kinds of Continuous Processing Lines, including many Tin Plate Processing Lines operating at speeds from 1000 to 4000 feet per minute.

AETNA · STANDARD

The Aetna-Standard Engineering Company

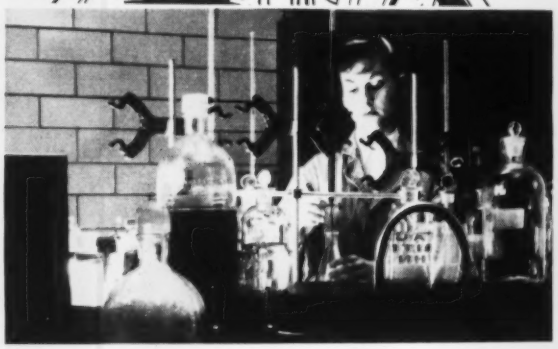
FRICK BUILDING · PITTSBURGH, PA.
ELLWOOD CITY, PA., WARREN AND AKRON, O.

57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip

Where tomorrow's machines get their bearings

THE MOST MODERN DYNAMOMETER in the bearing industry—with output torque of 30,000 lb. ft.—tests rear axles, transmissions, and other drive units. Modern electronic instruments swiftly and accurately record information on load, speed and efficiency. Besides the testing equipment shown on this page, there's a 7-speed deflection test machine. Equipment to study fretting corrosion. An electronic instrument development lab. Profilographs that measure surface accuracy to millionths of an inch. This new $1,500,000 research center has 32,000 square feet to house the latest testing equipment helping to make better and better bearings—solve your problems.

This new laboratory is the latest example of Timken Company pioneering. Pioneering that has made Timken tapered roller bearings first for 60 years. Our newest project is researching the realm of ultra-high bearing speeds and temperature. For more information, write The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*



WANT TO KNOW THE RIGHT LUBRICANT FOR YOUR EQUIPMENT? This Lubrication Engineering Laboratory uses the latest techniques to compile an approved lubricant list for Timken bearing applications—a list that'll help manufacturers and users of machinery stretch their dollars.

60 YEARS OF LEADERSHIP 1899-1959

TIMKEN®

TAPERED ROLLER BEARINGS